

Farm Chemicals

Pioneer Journal
of the Industry

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Vol. 119 No. 10

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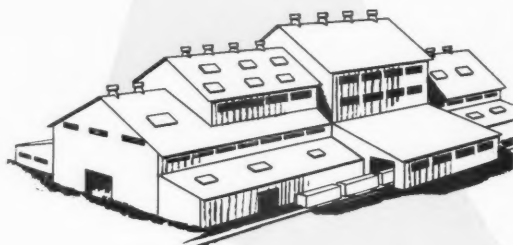
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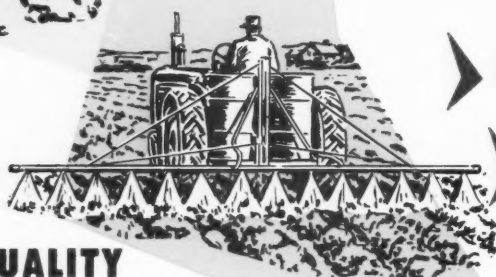
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Stimulate fertilizer sales with the addition of
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Tennessee's Nu-Z, Nu-Iron, Nu-M and Tri-Basic Copper Sulfate are especially suited for use in preparing nutritional and fungicidal spray and dust mixtures and for use in mixed fertilizers.

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TENNESSEE



CORPORATION

617-629 Grant Building, Atlanta, Georgia



HOW SOHIOGEN® SOLUTIONS CAN HELP YOU

Check out on core samples

ANALYSIS of random checks by fertilizer control officials sometimes can be surprising, especially in available P_2O_5 results.

One of the reasons can be your ammoniation methods. And here's where the *complete line of Sohio*gen solutions can help. They offer you the extra flexibility of formulation you need to get better availability results for more profits.

In ammoniation, many conditions influence phosphate performance — temperature, moisture, time and rate of ammoniation, and methods used. And

each of these can be influenced by your choice of solutions.

That's why you need a broad selection of nitrogen solutions with a wide range of chemical and physical characteristics. And Sohio's complete line helps you best adjust ammoniation to your methods and materials.

The man from Sohio will be happy to help you select the exact solution you need for the best job for you. **And Sohio's technical services are always available when you need them.**

We're serious about service at Sohio
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Farm Chemicals

OCTOBER, 1956

No. 10

Vol. 119

Pioneer Journal of Farm Chemicals Industry, Est. 1894

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In this issue . . .

A full report on the proceedings of the NAC Association meetings is provided, starting on page 39. Coverage includes panel discussions and reports on the highway program, Miller Bill and who and what influences the grower in his selection of pesticides.

Liquefied petroleum gas is discussed by an authority on page 43. What it is, its characteristics and advantages as well as disadvantages are presented. Comparative costs between gasoline and LPG are given. We believe that you'll find the article informative if you are considering conversion to LPG as a fuel.

Two experiment station workers report on chelates. The article presents some of the latest work being carried out on the possibility of feeding plants of zinc and manganese in chelate compounds. Turn to page 46.

In keeping with the recent highway program, on page 48 we are presenting an article on a novel application of fertilizers. Possibly the method will find use with other farm chemical applications.

Program for the forthcoming Fertilizer Section meeting, held as part of the National Safety Congress, is presented on page 49.

In this day and age when competition is at an all time high, trademarks are very important. M. E. Abramson provides information in his article which will find application in all businesses confronted with legal problems, or in need of general advice. For informative reading turn to page 50.

Cover story

In keeping with our coverage of the NAC meeting as well as the article on "Air Blasting Fertilizer," we feel the cover photo illustrates one of the methods which will become commonplace in the future.

FARM CHEMICALS

GRAFLOW means . . .

- reduced caking
- lower curing temperatures
- better flowability
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- improved drillability

NEW . . .

GRAFLOW (Trade Mark)

**FERTILIZER
CONDITIONING AGENT**

Here is the new conditioner that can give any pulverized or granular fertilizer a number of advantages. First, in your own plant, GRAFLOW will reduce corrosion of your handling equipment, because it is chemically inert. It will mix and coat evenly because it is basically high quality graphite . . . one of nature's finest lubricants. In addition, GRAFLOW has high coating power. The inert graphitic film isolates fertilizer particles from one another, lowering inter-granular friction. Thus, you benefit two ways with GRAFLOW: your own plant handling is aided, and your product gains greater acceptance. This is a new product, well worth an inquiry for details . . .



write our Chemical
Development Department
for complete
information.



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THE UNITED STATES GRAPHITE COMPANY

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OCTOBER, 1956

Business & Management

... News of the Industry

O-M Cooperates in Peruvian Research

A special research program aimed at improving the quality and yield of various agricultural crops is being undertaken at Peru. Dr. Elif Miller, chief agriculturist for the Chemicals International Div. of Olin Mathieson Chemical Corp., said that his company will cooperate with government in a series of tests concerning disease and nutritional problems affecting cotton, rubber, tea, coffee, potatoes, cacao and pasture lands.

Work will be carried out mainly by the research stations of La Molina and Tingo Maria.

Dow Sales Pass \$1½ Billion Mark

Sales of Dow Chemical Co. topped the half-billion dollar mark in its 1956 fiscal year ended May 31, climbing to a record \$565 million, 20 per cent over last year's sales, according to the company's annual report. Net earnings were

up 59 per cent to \$59.7 million, equivalent to \$2.52 per share of common stock.

FC Tolerance Guide Available

Because many industry members have expressed interest in the "Pesticide Tolerance Guide" which appeared on pages 45-54 of the September issue, the article has been reprinted, and copies are available at 25 cents each on orders up to and including 20 copies. Quantity prices will be sent on request. Write to FARM CHEMICALS, 317 N. Broad St., Philadelphia 7, Pa.

CIL Fert. Plant Wins Safety Award

For piling up a safety record of more than nine years without a lost-time accident, some 50 employees of the Chatham, Ont.,

fertilizer works of Canadian Industries were feted recently at the William Pitt Hotel at Chatham. The achievement won for them the second successive C-I-L prize.



Lorna Hands accepts an individual award for her contribution to the safety record from H. Greville Smith (right), C-I-L pres., as V. B. Lillie, gen. mgr. of the agricultural chemicals div. watches.

Olin Mathieson Realigns Executives

W. R. Grace & Co. has elected Marlin G. Geiger as executive vice president in charge of the chemical group composed of the company's seven chemical divisions. He is succeeded as Davison Chemical Co. Div. president by William E. McGuirk, Jr., former executive vice president of the Davison Div.

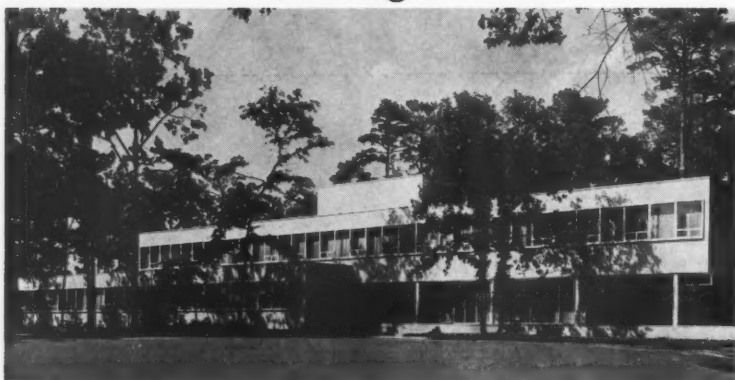
Geiger assumes duties previously carried out by Executive Vice President Hugh S. Ferguson, who becomes a member of the top echelon management group with corporate-wide responsibilities.

Dr. Charles E. Waring has been named a vice president of Grace Chemical Research and Development Co. Div. and will also serve as a vice president of the parent company.

Minneapolis Office For Balfour, Guthrie

Balfour, Guthrie & Co., Ltd. has announced removal of its Chicago Office to Suite 930, Midland Bank Bldg., Second Avenue South and Fourth Street, Minneapolis 1, Minn. Phone: Federal 2-4356.

New Smith-Douglass Quarters



Smith-Douglass Co. has moved into this new home office at 5100 Virginia Beach Blvd., just outside Norfolk, Va. The new executive offices house the parent Smith-Douglass Co. and Coronet and Smith-Rowland divisions.

best, by far, for

shipping and storing fertilizers

M/
MULTIWALLS
/W

by
**CHASE
BAG**

there's nothing better!

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Continuous monitoring means more than 400,000 separate quality determinations per month

Typical of AP&CC's company-wide quality control is the modern Quality Control Laboratory at Trona, California. Here, a staff of forty-four skilled technicians make as many as 55,000 separate quality determinations per month, in addition to the 345,000 by continuous monitors controlling process streams and finished products. Trace impurities, too small to measure by conventional analytical methods, are controlled by optical and electrical instru-

mentation. Tests for trace quantities of Sodium in chemical grade Muriate of Potash are made with ease and rapidity through techniques of flame photometry. Water solutions of Trona products are checked for color and turbidity by means of electrophotometers, resulting in Trona Boric Acid consistently meeting USP and BP quality standards. Constant checking with photovolt reflectometers helps maintain color of reflectance well above minimum guarantees, i.e.: current production of Lithium Carbonate at approximately 95% tri-green reflectance, Soda Ash guaranteed better than 99.5% Na_2CO_3 , chemical grade Muriate 99.9% KCl, Anhydrous Borax better than 99% $\text{Na}_2\text{B}_4\text{O}_7$.

Why not give your own products the benefits of the built-in and controlled quality of Trona's broad line of basic chemicals for farm and factory?

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FARM CHEMICALS

**HOW UNION MULTIWALLS BUILD MORE
BUSINESS FOR THE FERTILIZER INDUSTRY**

"In the citrus belt, we're sold on fertilizer in Multiwalls"

**F. M. Hahs, citrus grower,
Land O'Lakes region, Fla.**

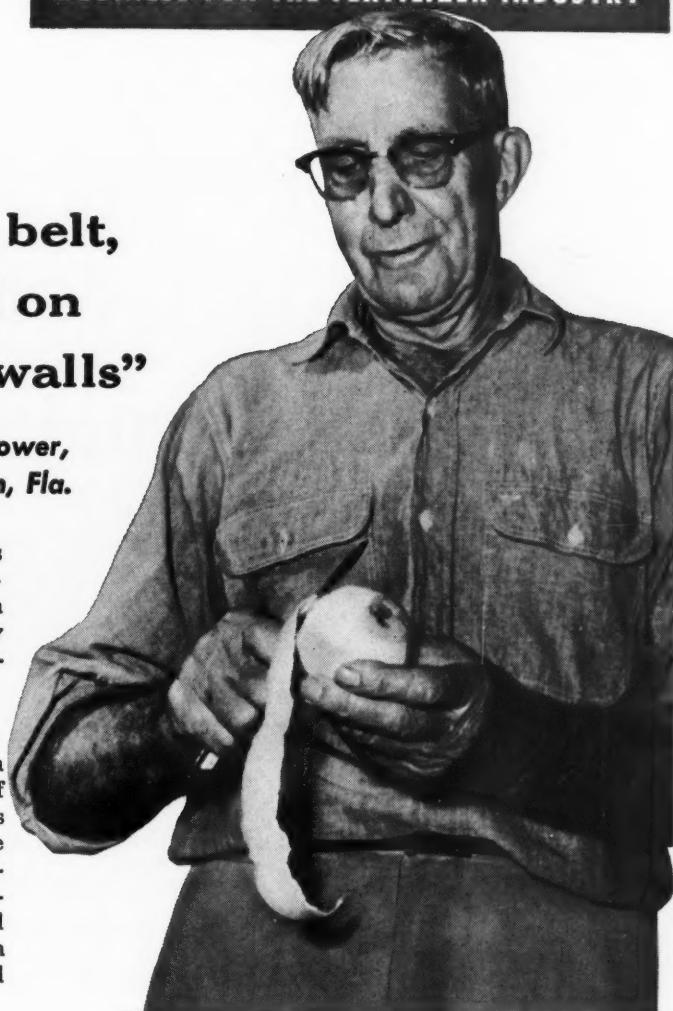
"When you open up an orange like this one," says Mr. Hahs, "you see—and taste—what good fertilizer can do. I've been sold on fertilizer for 33 years, but it's never been as easy to handle as it is now that it comes in Multi-wall bags."

Welcomes fertilizer tips from Union

This veteran citrus grower, who recently won a \$500 award as the "longest steady customer" of the Gulf Fertilizer Company of Tampa, operates his 29-acre citrus farm along scientific lines. He is an interested reader of tips on fertilizer application that come to him through Union's countrywide information program. Union-sponsored features on fertilizer use are seen or heard in newspapers and magazines, and on radio and television stations.

Most growers and farmers, like Mr. Hahs, find Multiwall paper bags, as made by Union, the most efficient containers for fertilizer. Tight and clean, Union Multiwalls are easy to handle, stock and store; do a real job of selling your brand name. They spell satisfied farm customers for fertilizer manufacturers and dealers, contribute handsomely to a steadily increasing volume of fertilizer sales.

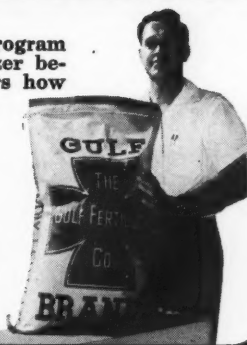
It's good business to use Union Multiwalls, made by a company that works actively to create good business for you.



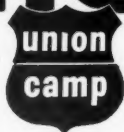
**"Union's Information program
helps sell more fertilizer be-
cause it shows farmers how
to use fertilizer more
efficiently."**

Mr. R. R. Reed, Sales Man-
ager, Gulf Fertilizer Company,
Tampa, Florida.

The Gulf Fertilizer Com-
pany, which has served
Florida for 54 years, pack-
ages many fertilizers in
Union Multiwalls.



UNION Multiwall Bags



UNION BAG-CAMP PAPER Corporation · 233 BROADWAY, NEW YORK 7, N. Y.

When it comes to service, delivery

"It's a pleasure to do business with International"

Mrs. Grace Koos Anderson, *President*
N. S. Koos & Son
Kenosha, Wisconsin



International's triple has excellent condition too. Digs easier than other river barge shipments of triple, says Jack Stolar, Superintendent of the Koos plant . . .



25,000-ton storage capacity of the Koos plant for mixed goods and raw materials. The plant turns out 15 grades, including two speciality lines for lawns and gardens.

An adequate inventory of bagged materials is kept on hand at all times to meet immediate demands from the Koos' three-state sales area. Koos also sells insecticides.

Modern offices, with the original Koos homestead in the background, are the nerve center for Badger Brand fertilizer's sales in Wisconsin, Illinois and Michigan.

ry and quality of product . . .



Mrs. GRACE KOOS ANDERSON looked out the window of her modern, wood-paneled office in Kenosha and said, "The old Koos homestead was right over there. So I guess you can say I really grew up in the fertilizer business."

This background has been paying off handsomely for her today in her management of a thriving 3-state fertilizer and insecticide business. Her wealth of experience and a close attention to details help Mrs. Anderson spot important, cost-cutting differences in service, supply and quality of suppliers.

And here are just two of the ways doing business with International has paid off for her:

Dependability of delivery: "In the many years we have used International, they have never once let us down," she says. This dependability pays off for the Koos plant by helping keep operations on schedule. It helps give them the economy of working out of box cars much of the year, without relying entirely on their 25,000-ton storage capacity. "Cuts handling costs, too."

Shipping service: "We're realizing freight savings right now by using International's barge shipments to Joliet, Illinois, and then by rail to Kenosha," she says.

Jack Stolar, superintendent of the Koos plant, outlines other advantages of International's triple. Stolar, who has managed two other midwestern fertilizer plants, says, "International, on the whole, has been a better triple than the rest. It digs easier when shipped up in barges and its texture is a little better."

If you have not already tried International's service — and International's superior triple superphosphate — why not put us to the test.

You'll find that International's is the triple with that "something-extra" quality that helps you cut costs . . . gives you better control of manufacturing conditions . . . helps stabilize your formulation problems . . . and will reduce the delivered unit cost of (P_2O_5).

So this year, for a better product and service you can depend upon, look to International Minerals & Chemical Corporation. You'll be glad you did.



PHOSPHATE CHEMICALS DIVISION

INTERNATIONAL MINERALS & CHEMICAL CORPORATION

General Offices: 20 North Wacker Drive, Chicago 6

. . . Business & Management

Shea Affiliate to Build New Plant

Shea Chemical Corp. president Vincent H. Shea has confirmed that an affiliated firm will construct a multi-unit plant this fall for production of hydrofluoric acid and related products. Several sites for the plant along the Ohio River are reported under consideration.

Construction is scheduled to begin this fall and production is expected by June, 1957.

Ashcraft Opens Des Moines Office

A new district sales office has been opened by Ashcraft-Wilkinson Co., sales agents for Duval Sulphur & Potash Co., at Des Moines, Iowa, under the supervision of James S. Greene.

W. Mercer Rowe, Jr., A-W vice president, said that the new office, located in the Insurance Exchange Bldg., will provide im-

proved service to customers in Colo., Ida., Iowa, Kans., Minn., Mo., Nebr., N. D. and S. D.

Scotland to Have Gran. Fertilizer Plant

Scottish Agricultural Industries Ltd. is constructing a new concentrated granular fertilizer plant at Leith, Scotland. To include three main process units—sulfuric acid production, phosphoric acid production and a formulation and granulation plant designed by Dorr-Oliver Inc., it will cost about \$8.5 million.

The sulfuric acid unit was to begin production in August, and construction of the phosphoric acid unit and granulation plant is reported near completion.

New Toxicology Laboratory Built

A new \$150,000 industrial toxicology laboratory has been completed by Industrial Bio-Test Laboratories, Inc., in Northbrook, Ill., a Chicago suburb.

Longhorn Reorganizes Neumann Joins Firm

Reorganization of Longhorn Construction Co., Sulphur Springs, Tex., has been reported by W. S. Tyler, president of the firm.



Tyler

Arnold Neumann, until recently general manager of Red Star Fertilizer Co., has purchased an interest in Longhorn and will act as business administrator for that firm. Vice president is Charles H. Tyler, field engineer in charge of construction.

Longhorn manufactures and installs continuous granulation plants and continuous acidulating phosphate plants as well as other related units.

Phillips Pacific Ships First Aqua Ammonia

The first shipment of aqua ammonia from Phillips Pacific Chemical Co.'s Coulee plant, near Kennewick, Wash., recently was delivered to Pacific Supply Co-operative. When completed, the plant will manufacture ammonia in both anhydrous and aqua forms.

Phillips Pacific is jointly owned by Phillips Petroleum and Pacific Northwest Pipeline Corp.

CIL Anhydrous to Flow This Fall

Production is scheduled to begin this fall at the Canadian Industries Ltd. \$9 million ammonia plant at Millhaven, Ontario, Canada.

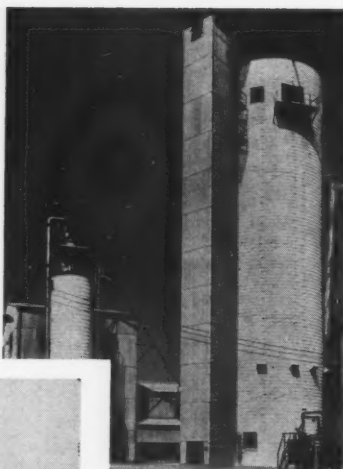
The largest plant of its kind in that country, it will have capacity to produce 200 tons of anhydrous ammonia per day.

FARM CHEMICALS

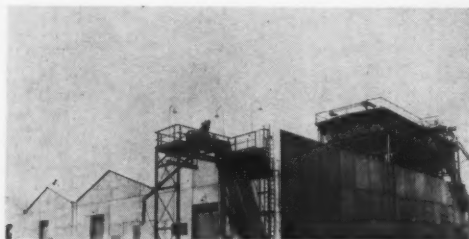
Prill Tower Largest of Its Kind

The prilling tower at the plant of Sohio Chemical Co. is the nation's largest and possibly the highest pre-cast concrete stave prill tower in the world, reports Marietta Concrete Corp. and Vulcan Engineering Div. of Vulcan-Cincinnati, Inc.

The project was planned and engineered by Vulcan, and the tower designed and constructed by Marietta.



ABOVE: The Sohio Chemical prilling tower at Lima, O. LEFT: Storage and bagging building, also constructed by Marietta Concrete Corp.



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The 30 years of unequalled experience of U.S. Phosphoric Products in phosphate fertilizers mean also unequalled quality and dependability today as your source for Triple Superphosphate.

Whatever grade you require, you can depend upon your Bradley & Baker representative to arrange your shipments for prompt, reliable delivery of a product superior in quality, uniformity and strength. Call upon him today.

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COARSE

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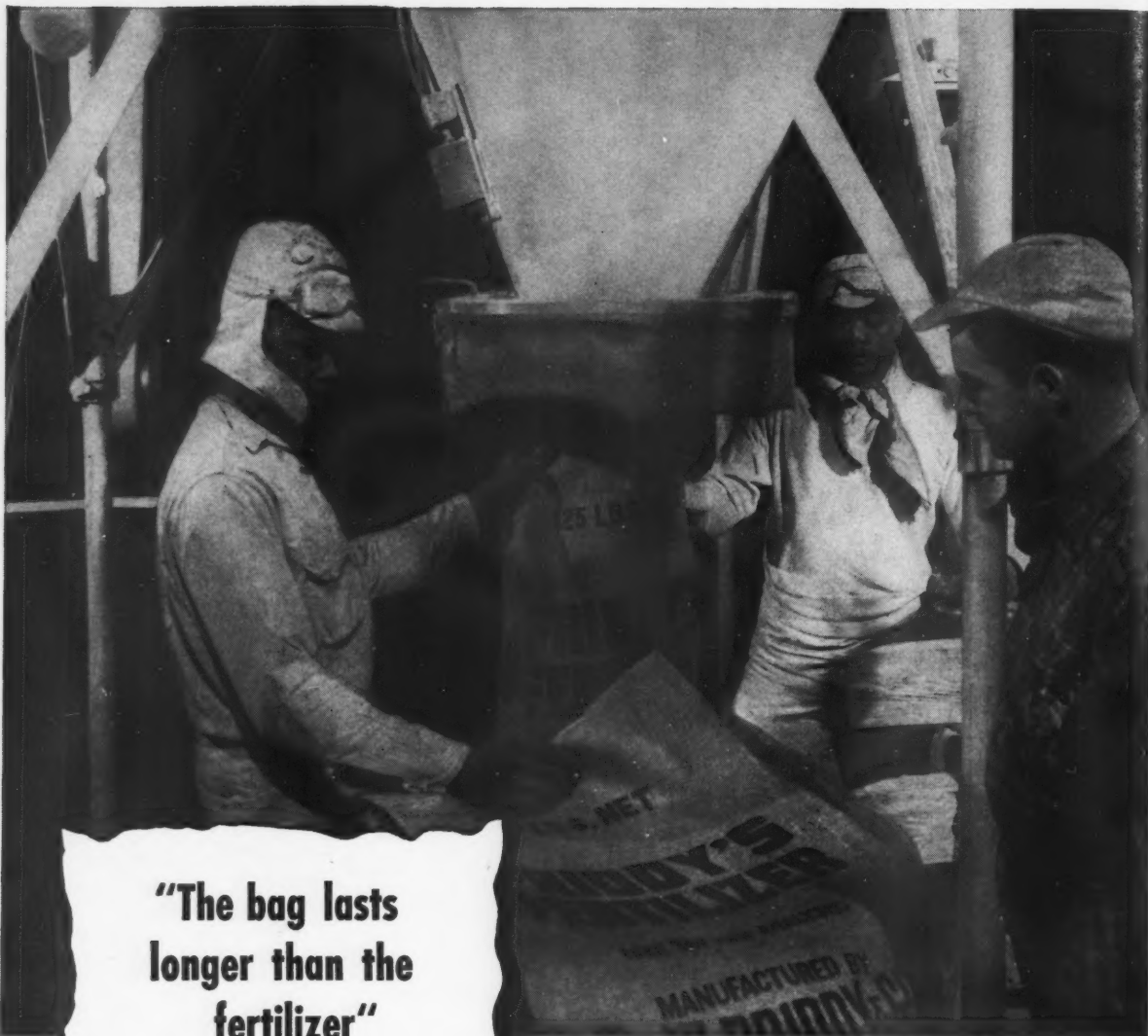


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"The bag lasts longer than the fertilizer"

says Sydnor Y. Priddy, president of Charles W. Priddy & Co., fertilizer manufacturers of Norfolk, Virginia. "Farmers want their fertilizer in burlap so they can use the bags to pack their own produce after they've used the fertilizer. Burlap bags have more uses around a farm than you can name.

"We know that burlap is safer for shipping fertilizer than any other kind of bag. No matter how they go—by train or truck, they won't chafe, break or tear."

Pack your fertilizer in burlap bags for easier handling in the plant and better protection during shipping. Use "bag appeal" to sell more fertilizer to farmers in your area.

**Just ask your own customers—
they'll tell you that burlap**



Is strong — takes dragging, dropping, man-handling — any tough job on the farm.



Gives good ventilation — keeps farm supplies and products fresh.



Laughs at sudden showers — wetness or dampness can't weaken it.



Saves money — extra value from re-sale and re-use.



Saves storage space — stacks to any height without slipping.



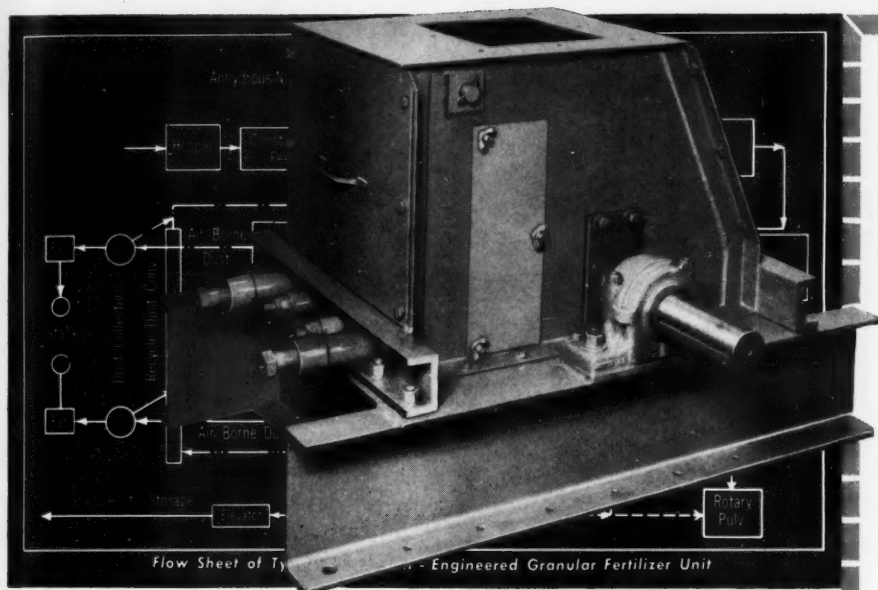
Has 1000 uses — always in demand on the farm (popular with farm wives, too!)

THE BURLAP COUNCIL

of the Indian Jute Mills Association

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This Rotary Pulverizer Belongs In Your Fertilizer Unit, Too!



IT'S STURTEVANT-ENGINEERED TO GRIND UP TO 35 TONS OF TAILINGS PER HOUR

Mixing plant operators agree! They'll tell you that a Sturtevant Rotary Pulverizer beats anything else for keeping a granular or powdered fertilizer unit speeding along at full capacity. It's far better than Hammer Mills with hammers that stick . . . Cage Mills that skip small pellets . . . Knives that only slice and shear. No overload stoppages nor clogged grates. So, daily accumulation of over-sized lumps is no longer a problem. And, to top it off, original Sturtevant "Open-Door" accessibility makes cleaning quick and easy.

Sturtevant Engineering can also help you in other ways. For more than 75 years, leaders in the fertilizer industry have depended on us for assistance in designing their units and in keeping them up-to-date. Since we custom-build mixers, batching units, granulators, hopper and conveying systems to fit agreed-upon specifications, you can be sure of getting a complete unit or individual components that fit your requirements like a glove. Why be satisfied with anything less?

Investigate now! Filling out the convenient coupon at the right is the first step toward better fertilizer at lower cost. Why not mail it today?

STURTEVANT Dry Processing Equipment

The "OPEN-DOOR" to lower operating costs over more years

CRUSHERS • GRINDERS • MICRON-GRINDERS • SEPARATORS
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Desired capacity is _____

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Firm _____

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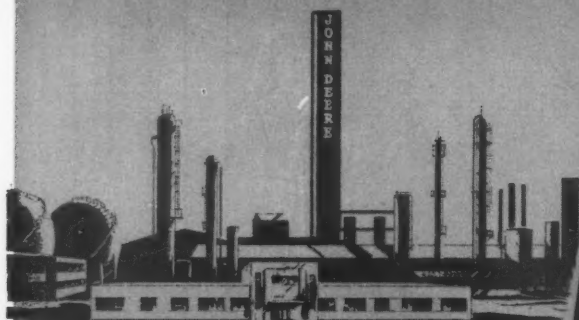
City _____ State _____ Zone _____

STURTEVANT MILL COMPANY, 140 Clayton Street, Boston 22, Mass.

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Also bulletins on Sturtevant machines for:

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NITROGEN— PLUS
SPEEDY DEPENDABLE SERVICE



CALL FOR
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VITREA CUSTOMERS ARE SATISFIED CUSTOMERS

because Vitrea means:

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- ✓ Quick acting, yet longer lasting UREA NITROGEN
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- ✓ Highest yields . . . and profits

Stock up NOW with high quality JOHN DEERE VITREA.

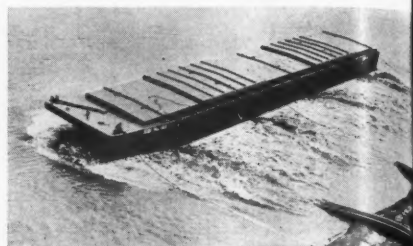


Grand River Chemical Division of
DEERE • COMPANY

2010 SOUTH UTICA

TULSA, OKLAHOMA

New O-M Barge



The first of six new covered hopper barges for use by Olin Mathieson Chem. Corp. is shown as it slides into the Ohio River. The 195-ft. barge was built by Dravo Corp.

Dividends Declared

Commercial Solvents Corp.

A dividend of 25 cents per share was declared Sept. 27 to outstanding common stock, payable Sept. 28.

International Minerals & Chemical Corp.'s board of directors has declared the regular quarterly dividend of \$1 per share on 4 per cent cumulative preferred stock and a quarterly dividend of 40 cents a share on common stock, both payable Sept. 30.

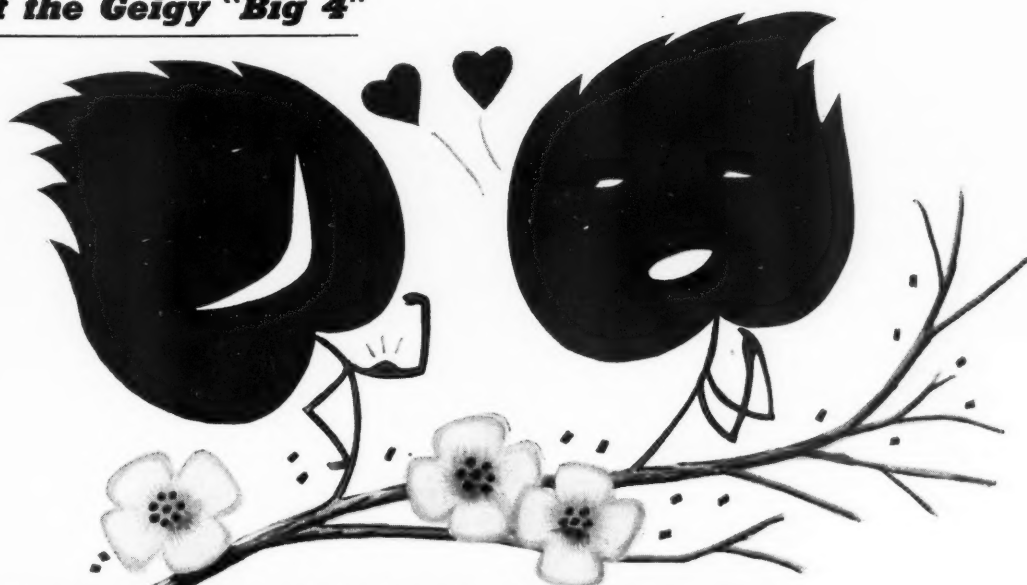
Ford Markets DAP

Ford now is marketing diammonium phosphate, produced as a by-product of coke making operations at its Rouge plant, Dearborn, Mich. Daily output is said to be about 80,000 pounds.

Correction

In our August coverage of the Virginia-Carolina Chemical Corp. management change, we incorrectly spelled names of the following new board members: Mr. R. T. Zickl and Mr. S. W. Frederick. Additional corrections are as follows: preferred stock arrears are \$15 million and not \$38 million as previously reported, and the voting requirement is 66⅔ per cent on recapitalization and not 51 per cent as had been stated.

one of the Geigy "Big 4"



A RICH SOURCE OF SOLUBLE IRON FOR YOUR FERTILIZERS

SEQUESTRENE*

IRON CHELATES

keeps plants green

Today "complete" fertilizers contain not only primary, but important secondary fertilizer components as well.

Especially important to the home gardener as well as the commercial grower is the correction of iron deficiency which results in yellowing leaves (chlorosis), retarded growth, lack of vigor, and in some cases eventual death of the plant.

When your formulations call for iron additives, insist upon SEQUESTRENE Iron Chelates produced by Geigy Agricultural Chemicals, pioneers in the field of metal chelates for agriculture. SEQUESTRENE Iron Chelates, in combination with fertilizer ingredients, provide a source of available iron necessary for normal plant growth. SEQUESTRENE chelates are completely water soluble.

The following SEQUESTRENE Iron Chelates are available to suit your fertilizer formulating requirements:

● **SEQUESTRENE NaFe Iron Chelate.** For use on acid soils. 12% iron as metallic.

● **SEQUESTRENE 330 Fe Iron Chelate.** For use on alkaline or slightly acid soils. 10.5% iron as metallic.

SEQUESTRENE Iron Chelates are available in 50-lb. drums, and 5-lb. bags.

In addition to fertilizer-chelate combination, SEQUESTRENE Iron Chelates may be applied alone as foliage sprays or soil treatments. For resale to the home garden trade SEQUESTRENE Iron Chelates are available in 1-lb. canisters and 4-oz. polyethylene bags.

3 more of the Geigy "Big 4"

CHLOROBENZILATE

Safe, effective miticide for control of various species of mites on apples, pears, azaleas, holly, spruce, and other ornamental and agricultural crops. Long residual action. Relatively non-toxic to bees.

METHOXYCHLOR

"General purpose" insecticide. For control of insect pests of livestock, crops, and stored grain. Safe to use. Long residual action. Ideal for aerosol and spray formulations.

DIAZINON

The most effective and economical residual fly control available. Only two or three residual sprayings are required to control flies in dairy barns for an entire season.

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DDT INSECTICIDES

*"SEQUESTRENE" is the brand name for metal chelates sold by Geigy Agricultural Chemicals, Division of Geigy Chemical Corporation.

GEIGY AGRICULTURAL CHEMICALS • Division of Geigy Chemical Corporation • Saw Mill River Road, Ardsley, New York

OCTOBER, 1956

15

. . . Business & Management

Escambia Gets New Name, Offices

Escambia Chemical Corp. is the new name for Escambia Bay Chemical Corp., R. U. Haslanger, president, has announced.

Executive offices of the firm now occupy the 20th floor at 261 Madison Ave., New York. Research and development is located at Cambridge and Newton, Mass., under the direction of N. C. Robertson, vice president, and production facilities are at Pensacola, Fla., under the direction of D. J. Stark, vice president.

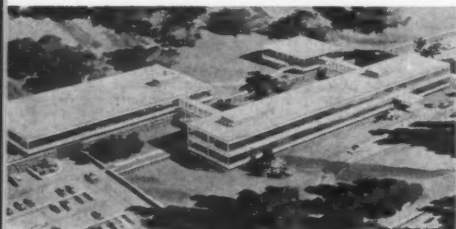
Escambia Chemical began commercial production of ammonia, nitric acid, ammonium nitrate and nitrogen solutions at its Pensacola plant last year. By the end of 1956, a 30 million pound polyvinyl chloride resins plant will be in production at the Pensacola site.

Geigy Hq. Moved From NYC to Ardsley

Headquarters of Geigy Chemical Corp. have been moved from New York City to Saw Mill River Road, Ardsley, New York. Included are air-conditioned administration and cafeteria buildings, as well as a laboratory and service building, all of reinforced concrete with exteriors of insulated white porcelain enamel panels.

The project was designed by

New Geigy Chemical quarters on Saw Mill River Road, Ardsley, N. Y.



Skidmore, Owings & Merrill and constructed by Vermilya-Brown, Inc.

Elko Co. Contracts For Liquid Plant

A new firm, Elko Fertilizer Co., has been organized to produce liquid fertilizers at a new one-story plant being constructed in Elkhorn, Wisc. Nathan J. Eck, president of Elkhorn Chemical Co., also is major stockholder and president of the new firm.

The new building, 28 x 48 feet, is of reinforced concrete and steel construction. In addition, six tanks with total capacity of about 70,000 gallons will be located on the property.

J. C. Carlile Corp. has been awarded the contract to engineer and construct the liquid fertilizer plant, including an aqua ammonia converter and reactor circuit. Storage tanks are being supplied by Columbia Steel Tank Co.

Eck reported that five or six different formulas will be available when the plant goes into production, and other formulations containing trace elements are planned. Capacity will be 150 tons per day. The firm reports that it will have the first converter to operate in Wisconsin.

Phillips Pet. Hosts SCS Workshop

Phillips Petroleum Co. was host at a three-day Soil Conservation Service Range Workshop held Aug. 20-22 at the firm's Agricultural Demonstration Project near Foraker, Okla.

Twenty-one soil conservationists from Colorado, Kansas, Arkansas and Oklahoma as well as Fred Renner, head of USDA's Range Conservation Div., were expected to be in attendance.

Fairfield Broadcasts on Clean Grain

Three broadcast programs, developed as a contribution to the Clean Grain Federal Extension Service-sponsored Program, have been prepared by Fairfield Chemical Div. of Food Machinery & Chemical Corp. Professor Donald Wilbur, of Kansas State College, and Wayne Colberg, of North Dakota, cooperated in the project with Carl Watts of Fairfield.

The programs have already been distributed to 75 radio stations in the Midwest.

Site Selected for US Borax Laboratory

An orange grove in Anaheim, Calif., has been selected as site for a modern research laboratory for United States Borax & Chemical Corp.

Designed by Albert C. Martin and Associates, the lab will be fully equipped for all phases of chemical research, the firm states. In addition to standard laboratories, special facilities will include distillation room, instrument lab, heavy experimental equipment room and a greenhouse for agricultural investigations.

Research will be conducted for all three U. S. Borax operating divisions—Pacific Coast Borax Co. Div., United States Potash Co. Div. and 20 Mule Team Products Div. Completion is expected late in April, 1957.

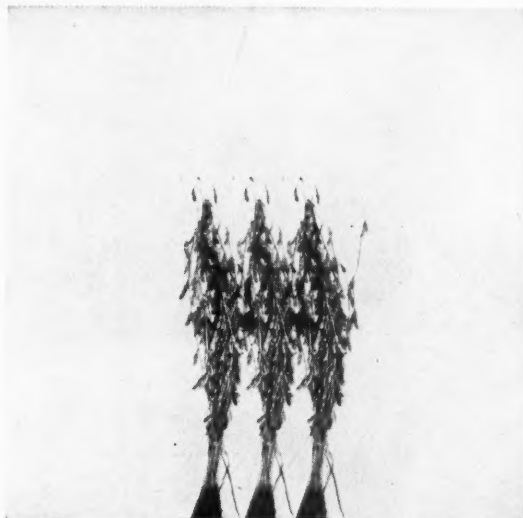
Artist's conception of research lab to be built by U. S. Borax & Chem.



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SOYBEANS,
POTASH-ENRICHED
FERTILIZERS
MAKE
THE
DIFFERENCE**



with sufficient potash



without sufficient potash

Today more and more farmers are realizing the importance of balanced fertilizers in raising healthier, more vigorous crops. Potash is a vital ingredient in balanced fertilizers because it increases plant resistance to disease and improves both yield and crop quality.

USP's high-grade muriate of potash has the highest K_2O content and is free-flowing and non-caking—important advantages in the manufacture of these modern fertilizers which help American farmers to better crops and better incomes.

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POTASH COMPANY**

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& CHEMICAL CORPORATION

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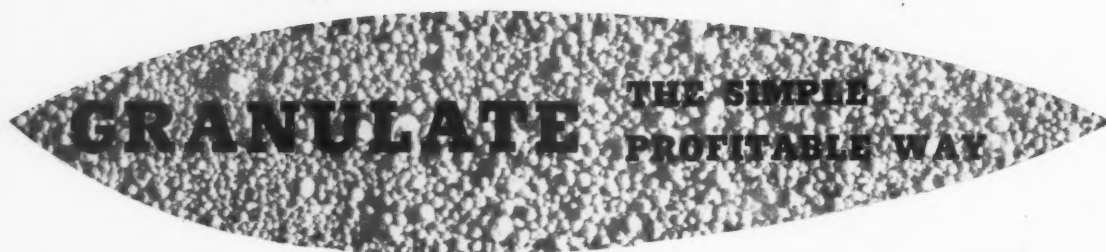


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**HIGRADE MURIATE OF
POTASH 62/63% K_2O
GRANULAR MURIATE OF
POTASH 60% K_2O MIN.**



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It's a proven fact — there are more Blue Valley Granulators operating in fertilizer plants today, than any other make.

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TRACTO LOADERS

Four Tractomotive models — all with HYDRAULIC TORQUE CONVERTER DRIVE, TIP-BACK BUCKET and CLUTCH-TYPE TRANSMISSION. TL-12 (left) is a rugged, 4-wheel drive excavator-loader with 1½-cu yd bucket. TL-6 (below) is ideal for confined area work — has ½-cu yd bucket. TL-10 and TL-11 are general-purpose loaders — speed materials handling indoors and out, have 1-cu yd buckets.



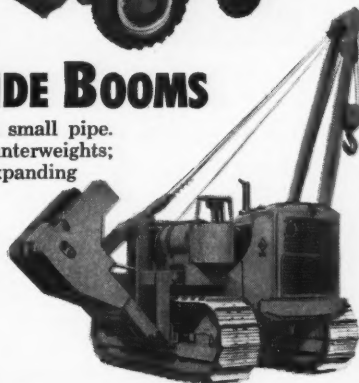
TRACTO SHOVELS

for all models of Allis-Chalmers crawler tractors. Standard buckets — 1½ to 4-cu yd capacity. Light materials handling buckets from 2¼ to 7-cu yd. Other special buckets and interchangeable attachments.



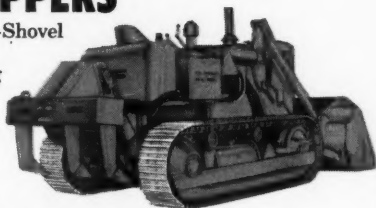
TRACTO SIDE BOOMS

for handling big and small pipe. Drop-proof safety counterweights; enclosed, internal expanding brakes; strongly constructed booms — for Allis-Chalmers HD-11, HD-16 and HD-21 Tractors.



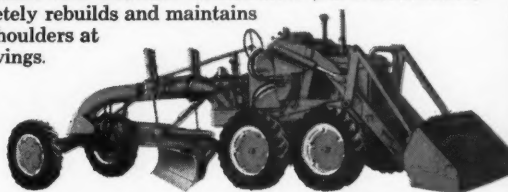
TRACTO RIPPERS

speed dozing, Tracto-Shovel and scraper loading. Loosen toughest going — save blasting. Available for all new models of Allis-Chalmers crawler tractors and HD-5, HD-9, HD-15, HD-19 and HD-20.



TRACTO LOADER

FOR ALLIS-CHALMERS MODEL D MOTOR GRADER — rear mounted, ¾-cu yd, hydraulically operated. Interchangeable with Shoulder Maintainer. This combination completely rebuilds and maintains road shoulders at big savings.



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Company
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City State



PEOPLE

American Chemical Paint Co. has appointed J. Charles Fletcher sales representative of the Agricultural Chemicals Div., covering Miss., Ark. and La. He succeeds Dan Chisholm, recently named sales supervisor of the Southern Div.

American Potash & Chemical Corp.



Emerson

Dr. William S. Emerson joins the firm as manager of research at the Whittier Research Laboratory. He had been with Monsanto Chemical Co.

Ashcraft-Wilkinson Co. At a recent board of directors meeting, C. Tom Nixon was appointed as-



Nixon



Hoover

sistant secretary of the firm, and H. Wayne Tyson was named assistant treasurer.

Wendell W. Hoover, Jr., is new sales representative in the Midwest for A-W. Headquartering in Columbus, O., he will assist Warren C. Huff, district manager, in Ohio, Western Ky., Mich., Ind., Ill. and Wis.

Boyce-Thompson Institute. Dr. Ernest R. Marshall has joined the Carbide & Carbon Chemicals Co. Fellowship at the institute to co-ordinate field testing of new agricultural chemicals.

Carbide & Carbon Chemicals Co. New technical representative for Crag agricultural chemicals is George Miller.

Columbia-Southern Chem. Corp. Appointments: H. C. Twiehaus as assistant technical director; Francis W. Theis, manager of Planning Dept., and Kenneth W. Richard, Jr., director, Development Dept.

Commercial Solvents Corp.



Kinnard

has named A. W. Kinnard III to its expanding Agricultural Chemicals marketing and distribution organization in the Southeast. He will reside in Tampa, and represent the firm in Fla.

Davison Chemical Co. Dr. J. D. Clary has been named production superintendent of the Florida Phosphate Div.

Food Machinery & Chem. Corp., WESTVACO MINERAL PRODUCTS DIV. Howard C. Peterson is named assistant in technical service for phosphate chemicals. He will locate in New York City.

Getz Exterminators. Frank L. March and Fred L. Clayton join the firm's Industrial Sanitation Div., and B. Kent Slaght is named Atlanta, Ga., sales manager.

Hercules Powder Co. Richard T. Yates, manager of the Agricultural Chemicals Div., Naval Stores Dept., has been given a special assignment and is succeeded as division manager by P. J. Reno. Replacing Reno as sales manager of the Agricultural Chemicals Div. is W. Coleman Edgar.

International Minerals & Chemical Corp. Three marketing executives appointed: Head-

ing advertising and sales promotion is Frank J. O'Neill; manager of product development is Henry E. Wessel; and Emanuel Heim-



O'Neill



Wessel



Heimberg



Zigler

berg has moved up to manager of market analysis.

PLANT FOOD DIV. John D. Zigler has been appointed general manager of the division. For the past two years, he has been operating manager. William A. Haign has been named supervisor of sales methods and training.

POTASH DIV. New manager of the Niagara Falls electrochemical plant is R. L. Logan, who has been assistant manager since 1952.

Naugatuck Chemical Div., U. S. Rubber Co. Otto Steinen is



Steinen

named assistant sales manager of agricultural chemicals. Steinen joined Naugatuck in 1947. He is succeeded as technical representative at Los Angeles by Warren Newall.

Northwest Cooperative Mills. W. E. Jones has been promoted to manager, Fertilizer Div.

Olin Mathieson Chemical Corp. Dr. Sylvan I. Cohen joins

FARM CHEMICALS

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A NEW MID-WEST PLANT MAKES FAST, LOW-COST DELIVERY POSSIBLE. ORDER NOW—SAVE MONEY!

There are two big reasons why you should sign *now* with Sinclair for your nitrogen solutions, anhydrous ammonia and aqua ammonia requirements.

First — the completion and opening of a centrally-situated new plant in Hammond, Indiana, means substantial savings on freight charges for most Mid-West nitrogen users.

Second — your seasonal supply problem can be solved by this plant's vast capacity... products will be delivered when you need them to meet *your* production schedule.

Let Sinclair help you solve your nitrogen supply problems and save you money in the bargain. Phone or write...

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the firm as an agricultural research specialist in the Research & Development Dept., Insecticides Div., at Port Jefferson, N. Y. He had been vice president of research for Gal-lowhur Chemical Corp.



Cohen

Pacific Coast Borax Co. Appointment of Lloyd L. Fusby as western manager, and Roger W. Hinchman as general sales manager is announced.

Spencer Chemical Co. James F. Brownlee has been elected to the Spencer board of directors, succeeding W. H. Jackson, who has been appointed special presidential assistant to President Eisenhower.

Sinclair Chemicals, Inc. has appointed Dr. Leo E. Orth as agronomist in their Nitrogen Products Div. headquarters at Chicago, Ill., and has named Maurice E. Peterson and Elwyn C. Weiss as sales representatives



Orth



Peterson



Weiss

for the division. Peterson will locate in Blencoe, Iowa, and Weiss at Winona Lake, Ind.

Virginia-Carolina Chemical Corp. John S. Battle, chairman of the board of directors, has announced election of Paul B. Sears to the V-C board.



French



Gates



Workman



Gillette

V-C appointments: A. P. Gates to general sales manager; John L. French and C. E. Workman to sales managers, General Sales Dept.; and Walter B. Gillette to sales manager, Bag Div.

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superior grinding equipment since 1891

BRADLEY PNEUMATIC HERCULES MILL

Provides a uniform grind from 20 to 325 mesh. Floor level installation provides easy accessibility . . . lowest installation and maintenance costs. Durable, non-clogging vibratory feeder for dependable, worry-free operation . . . even on material with some amount of moisture.

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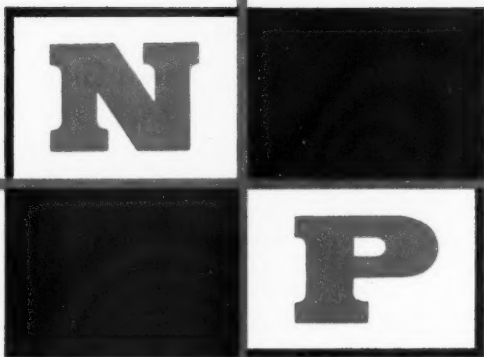
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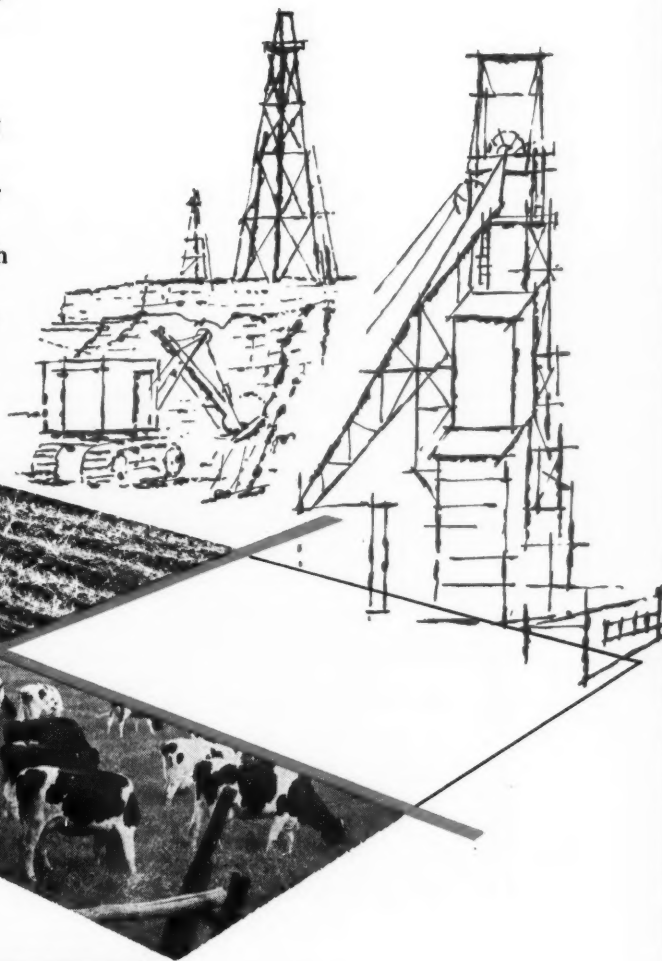
BOSTON



a joint venture in Potash

A new, substantial and dependable source of potash for fertilizer manufacturers is being developed by National Potash Company in New Mexico.

National Potash is a joint undertaking of Pittsburgh Consolidation Coal Company and Freeport Sulphur Company. The former is one of the nation's major coal firms, the latter a leading producer of sulphur with additional interests in oil and other minerals. The skills which they bring to the mining, refining and marketing of potash assure top quality, uniformity and service.



**NATIONAL
POTASH COMPANY**

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Associations & Meetings

Fert. Round Table Program Announced

Program for the Fertilizer Industry Round Table, to be held Oct. 16-18 has been announced by Dr. Vincent Sauchelli of Davison Chemical Co., chairman of the round table.

Included are discussions on sampling fertilizers and materials, changing technology and new developments in ammoniation and granulation, raw materials in processing granulated fertilizers, the Dorr ammonium phosphate process, Davison Trenton granulation process, controlling caking in granulated fertilizers, a panel on bags and bagging, flow control dust and fume control and laboratory equipment.

Nat. N Sol Assn. Meets in Sioux City

A full program is planned for the annual meeting and trade show of the National Nitrogen Solutions Association, to be held at the Sioux City Auditorium, Sioux City, Iowa, Oct. 16 and 17.

Speakers will include John D. Waugh, director of advertising for Nitrogen Div., Allied Chemical & Dye Corp.; Dr. Raoul Allstetter, vice president of National Plant Food Institute and A. V. Slack, chief program development staff, Div. of Chemical Development, TVA.

Exhibits will be open from 9 a.m. to 5 p.m. on both days. Climaxing the meeting, the annual dinner is set for the 17th.

SAACI Sales Clinic Oct. 15 in New York

Featured speaker at the fifth annual Chemical Sales Clinic will be Carter L. Burgess, Assistant Secretary of Defense, on "Defense Needs Technicians, Too." The one-day event, sponsored by the

Salesmen's Association of the American Chemical Industry, will be held Oct. 15 at the Hotel Commodore, New York.

New Feature at MWSIC Meeting

A new feature will be added to the Middle West Soil Improvement Committee annual meeting, to be held this year on Oct. 25 at the Sherman hotel in Chicago—a short afternoon session devoted to a showing of new MWSIC visual aids. Selected pictures from color film strips, TV shorts and other promotional aids will be shown.

On the agenda for the morning business meeting, to be opened by President W. M. Newman, are reviews by Executive Secretary Z. H. Beers of the results of 1956 educational publicity work, summaries of the results of field trips by MWSIC staff members, work with colleges and experiment stations and contacts with research agronomists and extension men. Reports also will be given on membership, new projects and activities for the coming year.

Industry Economics— CFA Meeting Theme

"Some Aspects of Fertilizer Industry Economics" will be the theme of the California Fertilizer Association's 33rd annual convention, scheduled for Nov. 11-13 at the Hotel del Coronado, Coronado, Calif.

Safety School a Success

Sixty-one superintendents, supervisors and safety leaders from North Carolina fertilizer plants and four other East Coast states attended the National Safety Council's Supervisory Training course, reported very successful, which was held in Wilmington, N. C., August 16-17.

AAFCO, Other Control Groups Meet This Month

The tenth annual convention of the Association of American Control Officials will be held on October 19 in the Shoreham Hotel, Washington, D. C.

Morning Session

Following the presidential address, titled "Industries—Large and Small—Make America" by Dr. M. P. Etheredge, Mississippi, speeches will be presented by Dr. Russell Coleman, National Plant Food Institute exec. vice president; Dr. W. F. Price, Swift & Co. Plant Food Div.; Dr. R. F. Poole, president, Clemson Agricultural College; and Hugh Riemer, president, Nitrogen Div., Allied Chemical & Dye Corp.

"Agriculture's Role in the American Story" is the topic of Dr. Paul Sanders, editor of "The Southern Planter," who will address the group at a luncheon in the Terrace Banquet Room.

Afternoon Session

At 2:30 p.m., Dr. F. W. Quackenbush, Indiana, is scheduled to begin the afternoon session, speaking on "Sampling Commercial Fertilizers." Results of a survey on changing from oxide to elemental basis for phosphorous and potassium will be presented by George Enfield, and reports will be given by investigators and special committees.

After electing new officers, the association will present a Presidential Plaque to Dr. M. P. Etheredge. Officers now serving AAFCO are Etheredge, president; J. D. Patterson, vice president, and Bruce D. Cloaninger, secretary-treasurer.

Meeting in Washington during the same week will be the Association of Official Agricultural Chemists, on Oct. 15-17, and the Association of American Pesticide Control Officials, on Oct. 19.

Calendar

Oct. 9. Western Agricultural Chem. Assn. Fall Meeting, Villa Hotel, San Mateo, Cal.

Oct. 15. Fifth annual chemical sales clinic sponsored by Salesmen's Assn. of the American Chemical Industry, Hotel Commodore, New York City.

Oct. 16-17. National Nitrogen Solutions Assn. annual meeting and trade show, City Auditorium, Sioux City, Iowa.

Oct. 16-18. Canadian Agri. Chem. Assn., Sheraton-Brock Hotel, Niagara Falls, Ont.

Oct. 16-18. Fert. Ind. Round Table, Shoreham Hotel, Washington, D. C.

Oct. 18-19. Assn. of American Fert. Control Officials meeting, Shoreham Hotel, Washington, D. C.

Oct. 22-25. National Pest Control Assn., Annual Convention, Detroit, Mich.

Oct. 22-26. 44th National Safety Congress and Exposition, sessions in Conrad Hilton, Congress, Morrison and La Salle Hotels, Chicago.

Oct. 23-24. Pacific N. W. Garden Supply Trade Show, Shrine Auditorium, Portland, Ore.

Oct. 25. Mid-West Soil Improvement Committee, Sherman Hotel, Chicago, Ill.

Nov. 2. Joint Agronomy Industry Work Conference, Atlanta Biltmore Hotel, Atlanta, Ga.

Nov. 7-9. Agr. Ammonia Institute Annual Convention, Atlanta Biltmore Hotel, Atlanta, Ga.

Nov. 7-9. Pacific Northwest Plant Food Assn. Annual Convention, Harrison Hot Springs Hotel, Harrison Hot Springs, B. C.

Nov. 11-13. Calif. Fert. Assn., 33rd Annual Convention, Del Coronado Hotel, Coronado, Cal.

Nov. 19-20. Eastern Branch, Ento. Society of America, Hotel Haddon Hall, Atlantic City, N. J.

Nov. 27-28. Indiana Fert. Conf., Memorial Union Bldg., Purdue University, Lafayette, Ind.

Nov. 29. Okla. Soils and Crops Conf., Okla. A & M College, Stillwater, Okla.

Dec. 3-5. CSMA Annual Meet., Mayflower Hotel, Washington, D.C.

Dec. 10-13. North Cent. Weed Control Conf., Sherman Hotel, Chicago, Ill.

Dec. 27-31. Ento. Society of America, Annual Meet., Hotel New Yorker, N.Y.C.



MURIATE OF POTASH for the PLANT FOOD INDUSTRY

THIS symbol stands for high-grade coarse and uniform Muriate of Potash (60% K_2O minimum). Southwest Potash Corporation provides a dependable supply of HIGH-K* Muriate for the plant food industry.

*Trade Mark

Southwest Potash Corporation

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GOVERNMENT

TVA Produces Exp. Liquid Fertilizers

TVA reports it now is producing liquid fertilizers on an experimental basis and on a pilot-plant scale. Productive capacity is about 10 gallons an hour, and the entire output is being used in tests and experiments.

Of the liquids undergoing tests, TVA said that "superphosphoric acid" appears to have unusual possibilities. It is between 40 and 50 per cent more concentrated than phosphoric acid commonly produced.

Another liquid concentrate is made with ammonium metaphosphate. The solid material, which is 90 per cent plant food, is said to be difficult to produce in solid form. Experiments show it can be made more easily in solution form.

Personnel Named for Soil Bank Program

Dwight W. Meyer has been appointed by USDA Secretary Benson as staff assistant in charge of grain acreage reserve programs in the new Soil Bank Div. Concurrently, Thomas E. Hamilton was named staff assistant in charge of the Soil Bank's conservation reserve program.

ICA Authorizations

India. \$8,000—agricultural pesticides (PIO/C No. 86-51-009-5-50334). Source: USA & poss. Terminal delivery date: December 31. Procurement through Emergency Procurement Serv., GSA.

Israel. \$15,000 (est. dollar equiv.)—agricultural pesticides (Foreign Currency Authorization No. 71-236-45-754-X003). Contract period: Aug. 29 to Dec. 31.

Source: Italy. Terminal delivery date: March 31, 1957.

Nepal. \$242,000—dieldrin insecticide, 50 per cent water wettable powder (PIO/C No. 67-51-908-8-60104). Source: World wide. Terminal delivery date: Oct. 30. Procurement through Emerg. Proc. Serv., GSA.

Pakistan. \$68,301—fertilizers (PIO/C No. 91-13-021-6-41860). Contract period: Aug. 21 to Oct. 31. Source: World wide. Terminal delivery date: June 30, 1957. Procurement through Pakistan Ministry of Industries, Dept. of Supply & Development.

Spruce Budworm Spraying Completed

Another campaign against forest insects has been successfully completed with the spraying of 1,370,000 acres of spruce budworm infested lands in the West, according to USDA.

The Forest Service, state agencies and private landowners cooperated in carrying out the campaign, which cost less than \$1 an acre.

Seven Chem. Eng. Patents to TVA in '56

Seven patents covering chemical engineering developments were issued to TVA during fiscal 1956, which ended June 30. Two were on fertilizer ammoniation, one on the method and the other on ammoniation equipment.

Other developments covered in the newly issued patents included the rotating electric phosphorus furnace, a process for making carbonated nitric phosphate fertilizer, a process for making ammonium metaphosphate, improvements in methods for the crystallization of ammonium nitrate and an improved process for drying gases by contact with phosphoric acid.

USDA to Survey Pesticide Labeling

A pesticide label survey is being conducted by USDA to find the status under the Miller law of every food and feed use now registered under the Federal Insecticide, Fungicide & Rodenticide Act.

At the recent NAC Association Spring Lake meeting, J. T. Coyne, of the Agricultural Research Service, announced the survey, in which NAC is cooperating.

Coyne said that USDA is preparing tabulations and summary sheets for each chemical. The tabulations of registered uses list the more common formulations of the particular chemical; the tolerance, if any, which has been established for each crop; the customary dosage ranges registered and any limitations upon each use.

"Finally," continued Coyne, "the tabulations provide space for comment on whether the specified directions are acceptable or will require revision in order to meet established tolerances, or any other pertinent information."

CCC Investment

USDA reports that on June 30, 1956, investment of the Commodity Credit Corp. in price-support commodities amounted to \$8,257,308,000. Of this, \$2,285,180,000 was in loans outstanding and cost value of inventories was \$5,972,128,000.

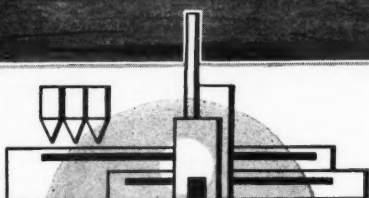
Marketing Quota & Acreage for '57 Cotton

A national marketing quota of 11,014,493 bales and a national acreage allotment of 17,391,304 acres for the 1957 crop of upland cotton have been announced by USDA. To be effective, the marketing quota must be approved by at least two-thirds of the cotton farmers voting in a referendum to be held not later than Dec. 15, 1956.

LINK-BELT HELPS BREA

NITRATE PLANT GET "on stream"

PRILLED AMMONIUM NITRATE is produced at this modern plant of Brea Chemicals, Inc., Subsidiary of Union Oil Company of California, Brea, California. Link-Belt equipment includes special dust-tight oscillating conveyors, coating drum, vibrating screens, pre-dryer and dryer, cooler and belt conveyors. In addition to ammonium nitrate, Link-Belt's vast experience applies to dry-mix, superphosphate, ammonium phosphate, ammonium sulphate, urea, granular and other types of fertilizer.



LINK-BELT "turn-key" SERVICE unlocks new efficiencies in fertilizer production

Under this inclusive 5-point
program, LINK-BELT will:

1. **PILOT THE PROCESS**, using our complete laboratory and test facilities.
2. **DESIGN THE SYSTEM** as an efficient, integrated operation conforming to your exact needs.
3. **FABRICATE THE EQUIPMENT**. Link-Belt makes a complete line—will also supply special requirements.
4. **ERECT THE PLANT**, providing crews and supervisory service.
5. **START THE OPERATION**, with field engineers ready to make final adjustments.

IN addition to normal production demands, requirements of this new Brea Chemicals, Inc. plant called for special processing equipment and dust control efficiency. Through Chemical and Industrial Corporation, engineering-construction contractor, Link-Belt supplied standard and specialized equipment to satisfy these requirements . . . has helped maintain full-capacity output and top product quality.

Link-Belt stands ready to cooperate with your engineers or consultants in supplying the exact equipment your process requires. Or, with a unique 5-phase "turn-key" service, Link-Belt can set up your entire operation . . . handling every last detail under a single, all-inclusive contract. To learn more of the savings this service can bring you, call your Link-Belt office. Or write for Book 2459.

LINK-BELT

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LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,147

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VIEWING WASHINGTON

with Farm Chemicals
Washington Bureau

on agriculture

Cotton acreage allotments for 1957 have been proclaimed by the USDA at 17.4 million acres—the same as for this year's production. At the same time, it set national marketing quotas at 11 million bales, compared with estimated 1956 output of 13.1 million bales.

To become effective, the marketing quota must be approved by two-thirds of the growers voting in a referendum some time before Dec. 15. If less than two-thirds approve, there will be no quotas, but allotments will continue, with price support reduced to 50 per cent of parity.

Total supply of cotton for the 1956-57 marketing year is estimated at a record 27.5 million bales. That's 9.9 million bales above yearly "normal supply" which includes domestic consumption, exports, plus a 30 per cent reserve. Carryover a year from now is expected to be no more than this year because of rising domestic consumption and exports. Thus, a reduction in the record surplus may be possible within a year.

This year's cotton crop forecast of 13.1 million bales compares with the 1955 crop of 14.7 million bales and the ten-year average of 13 million. Yield is indicated at 402 pounds per acre, 15 pounds less than last year's, but 119 pounds above average. Acreage on July 1 this year, which will not be harvested, is estimated at one million acres in Texas and Oklahoma and 300,000 acres in other states. This leaves 15.6 million acres for harvest—the smallest since 1882—and compares with 16.9 million acres in 1955 and the average for 1951-53 of 25.7 million acres.

The USDA reports that a proper combination of fertility and moisture is essential for most efficient yields of irrigated cotton. When soil fertility is low, growers can't get much of an increase in cotton yields from extra irrigation. But if fertility is increased—"especially by adequate nitrogen applications"—increased irrigation will produce substantial boosts in yield, roughly proportional to the amount of water applied. These findings are reported by Howard R. Haise, technical specialist on irrigation for USDA's Agricultural Research Service.

The farm price-cost squeeze is expected to tighten even further this fall. USDA economists expect the cost of things farmers buy, with the possible exception of fertilizer and pesticides, to hit a new high this year. A month ago, the government's index of prices farmers pay came to within less than one per cent of the all-time high established in May 1952. Higher prices for items made of steel, plus higher taxes, forecast a new record high for farm costs in the next few months.

Prices farmers receive, on the other hand, are heading down once more—dropping more than four per cent since July. With crops now coming off fields in volume, plus lower prices for livestock, chances are that prices farmers receive will go down still more.

Meanwhile, farm income for 1956 is expected to be slightly better than it was a year ago—almost entirely due to Soil Bank checks being mailed this fall. The Government predicts that U. S. farm net income will move from last year's \$11.3 billion to \$11.6 billion this year. The \$300 million increase expected is attributed to \$260 million from the Soil Bank and roughly \$40 million from the wool subsidy started two years ago.

VIEWING WASHINGTON

on business

A sizeable step-up in off-season fertilizer sales may be possible this fall now that more than \$260 million in unencumbered Soil Bank money has been sent out to farmers. The Agriculture Department started sending out checks to more than a half million farmers shortly after Labor Day.

This money comes close to being clear profit for the recipients—since it was paid out for underplanting allotments for corn, cotton, wheat, peanuts, rice and tobacco under the Soil Bank's Acreage Reserve program. Many farmers received checks for doing very little, although others received it for plowing under growing crops in order to comply with regulations.

Biggest concentration of 1956 Soil Bank money is in the Midwest. Of \$260 million paid out by USDA, roughly \$200 million went to farmers in the 12 Midwest states. The rest was divided among the remaining 36 states. Midwest farmers put about eight million acres of corn and wheat land into the reserve. Soil Bank land this year totals 12.5 million acres.

Crop-wise, corn land totaled the most in the bank, 5.5 million acres nationally, about five million in the Midwest. Wheat was next in the Midwest with more than three million acres.

Here's a break-down of Soil Bank funds going into the Midwest states this fall: Illinois, \$23 million; Indiana, \$11 million; Iowa, \$54 million (top-subsidized state); Kansas, \$8 million; Michigan, \$4 million; Minnesota, \$12.1 million; Missouri, \$10 million; Nebraska, \$34.5 million; North Dakota, \$14.2 million; Ohio, \$8 million; South Dakota, \$15 million; and Wisconsin, \$3 million.

Under Federal regulations, County Agricultural Stabilization Committees are permitted to open to the public the list of payment recipients 30 days after payment is made.

The Agriculture Department has announced the cost-sharing procedure under the Conservation Reserve portion of the Soil Bank. Cost-sharing on fertilizer applications will be handled in the same manner as payments under the Agricultural Conservation Program (ACP).

Generally, there will be no separate Federal cost-share payments for fertilizer applications as such. Costs of plant food applications will be included in lump payments for approved practices. Thus, the Government will pay a share of the over-all cost of getting a stand of vegetative cover, trees or shrubs on soil bank land.

Exceptions to this general rule will be made in counties where differing combinations and mixtures of seeds and plant food are approved for Conservation Reserve purposes. In these cases, direct payments will be made for specified mixtures and amounts-per-acre of fertilizer and seed.

The Conservation Reserve should not be confused with the ACP program. ACP is an annual program which has been running for years under which payments are made to help defray costs of conservation practices on any type of land. The CR program pays up to 80 per cent of the cost of installing conservation practices on land put into the soil bank. It aims at encouraging conservation on productive land.

The Food and Drug Administration has until November 13 to make a decision on Biostat, Chas. Pfizer Co.'s entrant into the field of prolonging the shelf-life of processed poultry with an antibiotic. The Agriculture Department issued a certificate of usefulness for the product August 13, and the FDA has 90 days in which to make a decision.



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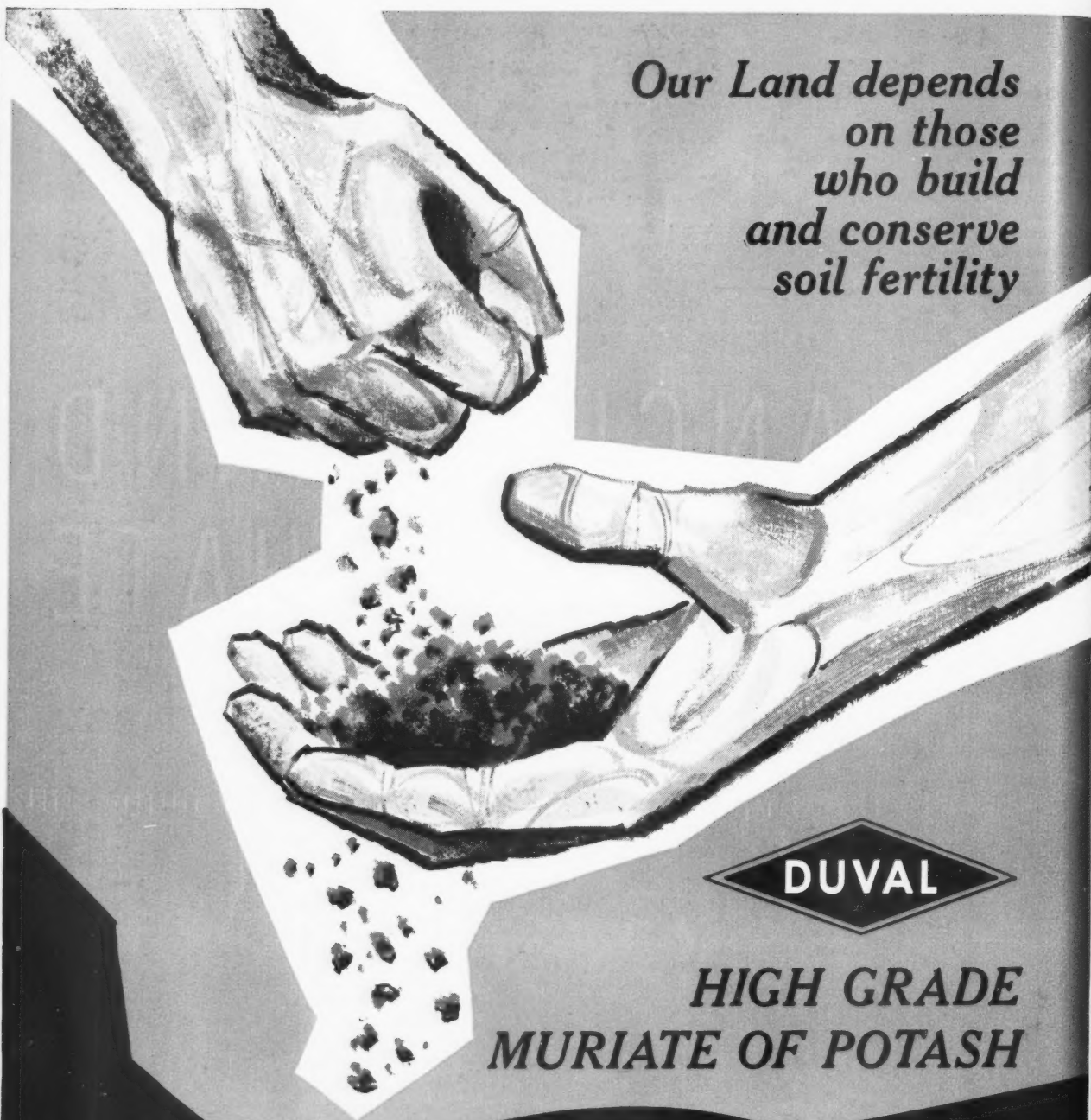
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Chemicals

316—Material Calculator

A simple device to determine the pounds of raw material required for any fertilizer mixture is being distributed free of charge by Nitrogen Div., Allied Chemical & Dye Corp. The calculator consists of a special slide rule built into a stiff cardboard frame. A mixer can compute the amounts of various types of nitrogen solution, superphosphate and potash materials that will be needed to manufacture any fertilizer grade. Rugged and compact, the device fits into a back pocket. To obtain one

CIRCLE 316 ON SERVICE CARD

317—Nitrogen Solutions

Nitrogen Div., Allied Chemical and Dye, now has a new bulletin on manufacturing nitrogen fertilizers. Subjects covered include formulations of nitrogen solutions, cooling ammoniated mixtures and handling nitrogen solutions, plus first aid hints. Conversion tables and acid equivalent charts are all handy for ready reference. Allowance has been made for future additions or changes by binding it with a removable slider. For more information and assistance in the formulation of liquid fertilizers

CIRCLE 317 ON SERVICE CARD

318—Antifoam Agents

Hodag Chemical Corp. has just released a four page booklet on the various methods of feeding antifoam agents into batch or continuous processes. Methods described in the folder cover simple manual feeders to complex operations. These application methods are particularly adaptable to most operations where foaming presents a problem. For further information

CIRCLE 318 ON SERVICE CARD

319—U.S.I. Fert. Supplies

From U.S.I. in Tuscola, Ill., fertilizer manufacturers are able to obtain essential fertilizer supplies on short notice. U.S.I. now has available anhydrous ammonia and fertilizer solutions in large quantity and in easy access to midwest locations. A 400 ton per day plant produces all grades of sulfuric acid; operation during the entire year allows for storage during off season and permits ready supply during periods of heavy demand. Capacity is to be 30,000 tons. Additional information is available.

CIRCLE 319 ON SERVICE CARD

320—Granular Materials

Information is available from the Floridin Co. on their granular fullers earth products. Data regarding mesh sizes and formulation properties are included in the bulletin. For additional information

CIRCLE 320 ON SERVICE CARD

OCTOBER, 1956

FREE INFORMATION to help you
solve fertilizer, pesticide problems

Reader Service

321—Nitric Acid Production

For more information on the Fluor Corp.'s nitric acid production operation circle the indicated number below. Describing efficient and low-cost operation, the bulletin also includes material covering flow sheets and process information. Your copy can be had if you

CIRCLE 321 ON SERVICE CARD

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Process Equipmt.

322—Control Products

Descriptive literature is available on the new line of control products being handled by A. W. Cash Co. Products include pneumatic recording controller controls and a recorder of both pressure and temperature. Pressure ranges are from 0-5 to 0-5000 psi and temperature range is from -350° F. to 1200° F. For information

CIRCLE 322 ON SERVICE CARD

323—Heat Exchangers

A new, illustrated booklet titled, "Acid Resistant Heat Exchangers" is being offered by the Swenson Evaporator Co., a division of Whiting Corp. Important data on the tube mounting, the types of

corrosion resistant materials available and the advantages of the neoprene ring gaskets are covered. For your free copy

CIRCLE 323 ON SERVICE CARD

324—Crushing Equipment

Crushing equipment for many types of products has recently been introduced by Sprout, Waldron and Co. The equipment is actually a two-stage crusher—one a pre-breaker and the other for final reduction. Capable of reducing lumps ranging in size 4" to 5", and extremely friable materials, 6" to 8"—all can be handled without difficulty. Simple adjustments allow a minimum of maintenance. More information is available if you

CIRCLE 324 ON SERVICE CARD

325—Storage Tanks

American Car and Foundry has available tanks ranging in size from 100 to 30,000 gallons for storage of liquid or gas. Steel grit blasting of the exteriors allows for smooth surface of primer; radiography of all welded seams assures freedom from slag inclusion, porosity and undercutting. Other advantages in construction eliminate stresses set up during forming and welding, providing resistance to fatigue caused by temperature changes or pulsating loads.

CIRCLE 325 ON SERVICE CARD

326—Patterson Mill

Patterson Foundry and Machine Co. has recently made available a new booklet giving complete details on their new ball and pebble mill. Improvements in this mill are slated to bring greatly improved grinding and efficiency to the operation. Copies are free. To obtain one

CIRCLE 326 ON SERVICE CARD

327—Jeffrey Line

Jeffrey Manufacturing Co. has available a booklet describing its complete line of supplies covering conveying machinery, feeders, vibrators, screens, pulverizers and crushers. In addition, the line covers equipment such as bin valves, elevating machinery, chains, and general equipment for waste removal of sewage and water. For more information

CIRCLE 327 ON SERVICE CARD

328—Sturtevant Products

Sturtevant Mill Co. has available technical data concerning the company's products covering crushing, screening, grinding, mixing and feeding. For more information to assist you in a better and more money saving operation

CIRCLE 328 ON SERVICE CARD

329—Plastic Pipe

A new line of light walled polyvinyl chloride pipe has been introduced by the Alloy Tube Div. of Carpenter Steel Co. This thin walled pipe is easily fabricated on standard metal and woodworking equipment. It can be formed, sawed, machined, hot gas welded and solvent cemented. One series is a high chemical resistant type, with working pressure of 150 psi at 75° F. The other has high impact strength and a rating of 125 psi at the same temperature. Installation is easy and inexpensive. For additional information

CIRCLE 329 ON SERVICE CARD

Materials Handling

330—Link-Belt Supplies

A 44 page brochure is now available from Link-Belt Co. giving complete information on its line of equipment designed for both the chemical and agricultural producing industries. For further information and a copy of the bulletin please

CIRCLE 330 ON SERVICE CARD

331—Belt Idlers

Joy Mfg. has a booklet of design and application data for those who select, specify and purchase belt conveyors to handle bulk materials. It includes descriptions, drawings, specifications tables and suggested applications for idlers and various troughing, impact, training and return brackets to use with belts. For your copy of this valuable booklet please

CIRCLE 331 ON SERVICE CARD

332—Hydraulic Lift

This unit is designed for maximum reach of 42 ft. above floor level. It folds up to pass through doorways, narrow corridors or in and out of elevators. A ladder provides access to the platform in the

down position. Control for raising, stopping and lowering by means of a pushbutton allows for simple operation. The platform can be rotated through 360 degrees, and can hold loads up to 350 pounds. Additional information is available if you

CIRCLE 332 ON SERVICE CARD

333—Com-Bin-Feeders

Pulva Corp. has announced a new catalog giving complete information on its full line of feeders. This new condensed catalog features pictures of various sized units and modifications broadening its field of application; also includes table of standard sizes and capacities. For your copy of this handy catalog

CIRCLE 333 ON SERVICE CARD

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334—Straddle Lift Truck

Complete specifications bulletins are available from the Yale & Towne Mfg. Co. on its new line of rider straddle type industrial lift trucks. Information provided covers complete engineering data and all key features of the equipment. The line ranges in size from 2000 to 4000 pounds.

CIRCLE 334 ON SERVICE CARD

335—Payload Shovel

Numerous new features have been incorporated in the design of the Frank G. Hough Co.'s new "Payload" tractor shovel, including the new Hough-designed and manufactured "Paylomatic" power shift transmission. The necessity of coming to a stop for a range shift is completely

eliminated with this new no-stop transmission since all shifts in both forward and reverse can be made without even slowing down. Finger tip directional control can be operated under full engine speed, in any gear. The torque-converter gives infinite speed ratios for maximum performance. Further details on this improved "Payload" can be gotten if you

CIRCLE 335 ON SERVICE CARD

Packaging

336—Packaging Booklet

Answers to carrier regulations and determination of package type are available in the new booklet recently made available by Hinde & Dauch Co. Packed with up to date information to help manufacturers do a more economical and efficient job of packaging, this new booklet provides a convenient check list to determine specifications for better packaging. Illustrations provide additional assistance.

CIRCLE 336 ON SERVICE CARD

337—Valve Bag

The new St. Regis pasted valve bag has been well received by packers of granulated fertilizers, according to the manufacturer, and features an insert sleeve that closes securely against the squared bag top for less sifting, cleaner packages. The squared top provides more room for your brand imprint and instructions and permits stacking and loading. For more information

CIRCLE 337 ON SERVICE CARD

338—Bagging Scales

Special features of the Richardson Scale Co. bagging scale include power driven belt feeder, pneumatic gate assist, dust exhaust vents, and compensation and counter mechanisms. All information including designs and dimensions is available in their new bulletin. Presented in two colors and illustrated with photographs, it will make informative reading. For a copy

CIRCLE 338 ON SERVICE CARD

Miscellaneous

339—Spray Respirator

A new bulletin giving detailed information about the MSA Farm Spray respirator and other respiratory protection has been prepared by Mine Safety Appliances Co. Snug fitting, lightweight and comfortable, it effectively filters the air breathed by workers as they dust or spray. In addition, the bulletin describes the "All-Vision" Chemical Cartridge Respirator and the MSA Industrial Gas Mask. More information is available if you

CIRCLE 339 ON SERVICE CARD

See pages 54 and 55 for information
on these Reader Service numbers—

340—Clark Bucket

341—Haveg Tanks

342—Auto. Scale

343—New Payloaders

344—Package Mix. Unit

345—Liquid Fert. Hose

346—Granulating Units

347—Level Indicator

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Chemical Processing Staff Photo

60,000 tons to distribute yearly; lots as small as 25 lbs.

International Salt Company chooses Michigan for rehandling job in new Chicago warehouse

This world-famous company, largest producers of salt in America, have a tremendous material-handling problem at their recently-completed, completely-modern warehouse in Chicago. Into this huge, arched, cathedral-type building 178 feet long, 162 feet wide, and 70 feet high comes 60,000 tons of salt a year. All of it—120,000,000 pounds, in 10 different types and sizes—has to be re-handled for shipment. Some lots run 50 tons or more each... some are as small as 25 pounds. One tractor shovel does *all* re-handling from stockpiles, feeding the salt, on order, to centrally-located weigh hoppers for bagging or bulk shipment (same unit also loads bulk salt, at times of peak demand, directly into trucks).

Tractor Shovel is key to operation

In selecting this tractor shovel, so important to the entire operation, prime considerations were:

1. Large capacity

2. Speedy handling
3. Utmost safety and
4. Low maintenance costs.

In the opinion of International Salt Company officials, only one machine passed ALL tests with flying colors: a Michigan Tractor Shovel!

Chosen from 6 models

With six basic models, 44 to 165 hp, and buckets from 6 cubic feet to 5 cubic yards, to choose from, International Salt Company picked the 80 hp, 1 cubic yard, bucket wheel drive Model 75B you see here.

This unit, like all Michigans, gives International Salt the efficiency only a matched all-Clark-designed and built power train can give. No-clutch shifting to change speeds and direction at the flick of a lever. Power steering. Shock absorbing torque converter with 3-to-1 torque multiplication. Forward and reverse speeds to 26 mph. Adequate power and weight, plus low-level rollback and low-level-carry, to get and

deliver heaping loads. Utmost safety, with big brakes and excellent all-around visibility. Planetary axles which *completely eliminate axle breakage.*

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No matter what kind of bulk material you have to handle—fertilizer, foods, sand, or chemicals—these Michigan features are well worth checking. It's simple to do. Write or call us any time. We'll be glad to help you analyze which size Tractor Shovel best fits your needs... then show you that machine in action, in your plant, doing the jobs you want to see done!

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NAC Assn. Proceedings

AT THE 23rd annual meeting of National Agricultural Chemicals Association, members saw the election of two new officers: F. W. Hatch, manager, Agricultural Chemicals Sales Division, Shell Chemical Corp., and J. V. Vernon, president, Niagara Chemical Division, Food Machinery and Chemical Corp., who were elected president and vice president, respectively.

F. W. Hatch has served as vice president of the association for the past two years and succeeds W. W. Allen, manager, Agricultural Chemicals Sales, The Dow Chemical Company.

Succeeding Hatch in his capacity as vice president will be J. V. Vernon, who has been associated with the NAC board of directors since 1954.

In addition, three new board members were installed: A. W. Mohr, president, California Spray-Chemical Corp.; G. R. Vila, assistant general manager, Naugatuck Chemical Division, U. S. Rubber Co.; and T. L. Wilkerson, general sales manager, Agricultural Chemicals Div., American Cyanamid Co.

Retiring this year from the board are Paul Mayfield, vice president, Hercules Powder Co., and August Petrus, president, Cotton States Chemical Co.

In addressing the group, Vernon highlighted some of the areas which should be stressed by manufacturers. "Improve our existing products so that better performance in field use may be attained," he said. On covering the area of increased usage, he

went on to state, "Improve our technique of use. This should be done in cooperation with Federal and state experiment stations so that maximum benefits can be obtained from the use of our products by the farmers who apply them to their crops."

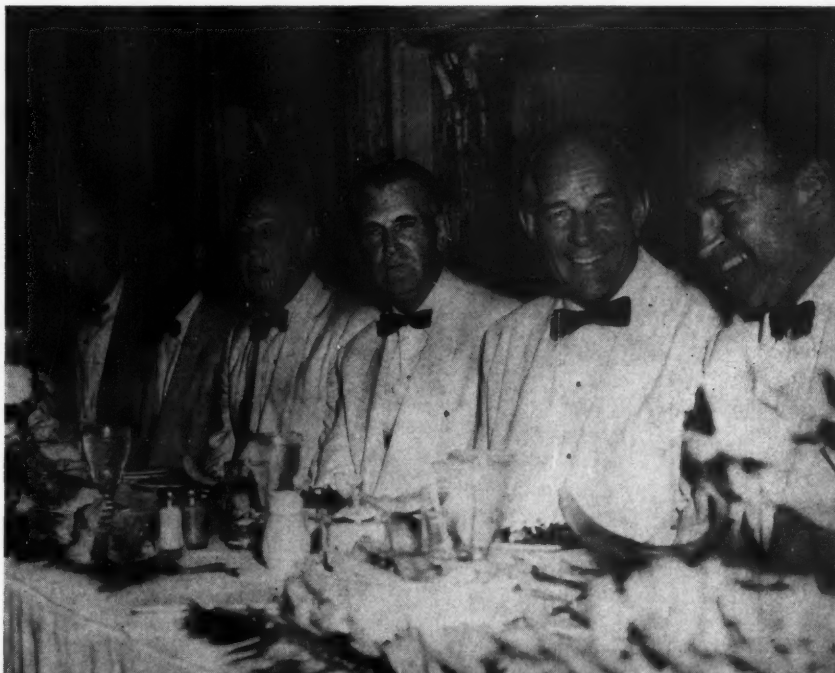
In discussing other aspects of the industry on a world-wide basis, he stressed "continued effort and cooperation in the world-wide problem of stamping out malaria through adequate pest control."

With the forthcoming expansion of our highway program and its varied effects on our economy he emphasized "the use of pesticides and herbicides on highway rights-of-way. As we get further into the road building program, this area will offer great opportunities for developing new business in our field." In closing his address Vernon stated, "There are great opportunities ahead of us if we are skillful enough to run the business of this industry so we can survive to enjoy the fruits of our efforts."

President's Address

W. W. Allen, retiring president of the association, stressed the importance of making available information accumulated on agricultural chemicals so the public may better understand them. He likened it to the steel plow when it first appeared. Many people feared it would poison the soil and that it would injure the soil as well as the livestock and people who ate those crops. He stated, "It sounds very familiar today. People who do not understand

Seated are the recently elected officers and retiring president of the NAC Assn. Left to right, they are: board member, T. L. Wilkerson, American Cyanamid; retiring pres., W. W. Allen, Dow Chemical Co.; newly elected pres. F. W. Hatch, Shell Chemical Corp.; vice pres., J. C. Vernon, Niagara Chemical; board member, A. W. Mohr, Calif. Spray Corp.; board member, G. R. Vila, Naugatuck Chemical.



that chemicals are as natural as salt, pepper and sugar sometimes voice their misunderstanding by attacking all agricultural chemicals.

On areas affecting the industry he stressed the necessity of having well-qualified personnel. Covering this segment, he said, "Our industry offers to many well-qualified men an opportunity for personal satisfaction and for professional and business growth and corresponding rewards. We need good men. We need trained men. In the year ahead NAC expects to go to work to interest more young men of ability in the opportunities and challenges of this business and to provide for more adequate education toward this end."

The retiring president then predicted that the industry would see a tremendous sales growth, and stated, "If any producer or handler of agricultural chemicals finds that his own sales are not in line with that curve, it is time for him to take a close look at his own future."

USDA Research in Entomology

Representing the USDA in entomological research, Dr. E. F. Knippling declared, "Hundreds of destructive pests are readily controlled with chemicals, and some of our leading crops, such as cotton, most vegetables, many fruits and certain forage crops would not be produced profitably without the various insect control chemicals that are available to the growers."

In discussing the cost vs. production relationship he pointed out areas which should be investigated. "Increasing costs of crop production demand that maximum yields be obtained at minimum costs. To make substantial progress in this direction, we need extensive and intensive research on methods of insect survey and detection, economic effect at different levels of infestation, effect of climate host relationships, inter-relationship to the insect and biological control agents and other factors. Substantial research effort on this problem is long overdue."

Looking to the future, Dr. Knippling said, "One

C. M. Brown, Gen. Chem. Div., Allied Chem. & Dye Corp.; G. C. Romig, American Chem. Paint Co.; E. H. Phillips, GLF; W. J. Liipfert, Woolfolk Chem. Works Ltd.; Lea S. Hitchner, Executive Secretary, NAC Assn.

of the greatest services that the entomological profession can render is to determine for the grower how and when to employ the insect control tools we have. We must be in a better position to make long range forecasts of insect outbreaks and to appraise the significance of an insect population in terms of potential damage to a crop."

Who and What Influences the Growers in Their Selection and Use of Pesticides

A panel representing farm press, radio, extension services, sales managers and retailers said that American farmers are influenced by down to earth facts from reliable sources, but that they quickly reject exaggerated claims and are skeptical of information from untried sources.

Members of the panel included moderator Montgomery Budd, Hercules Powder Co.; W. A. Haffert, Jr., editor, "New Jersey Farm and Garden;" Dr. E. Fisher, Wisconsin extension entomologist; B. J. Smith, vice president, Chipman Chemical Co.; F. W. Jones, dealer, Muleshoe, Tex., and John McDonald, radio farm director.

Haffert stated that when trying to sell to the farmer "Be ready to prove that what you sell can make a farmer more money or can satisfy his pride."

Continuing, he discussed various sources from which farmers get information. In the past 30 years, upwards of 13 surveys have been made to find out sources of information. Ranking highest were agricultural publications, found to have the most effect, which stood 50 per cent above the next form of media.

In further discussion he noted that the mediocre farmer sometimes takes upwards of ten years before he will adapt a new practice in his operation. During this period, he is being influenced by many and different forms of information. Haffert said, "I believe it is the teamwork of all agencies—manufacturer, publisher, dealer, state and county extension people, radio, television, direct mail and all other types and means of communication that gets the job done."

A spokesman for the extension services, Dr. E. Fisher, mentioned that between the time a farmer becomes aware of a new practice and the time he adopts it, there are intermediate stages of interest, evaluation and trial.

At the commercial level, B. J. Smith of Chipman Chemical Co. stated that many factors influence potential buyers prior to actual purchase. Elaborating on this he stressed three groups which come into direct contact with the buyer. These are commercial applicators, commercial scouts and the local dealer. In discussing the first two, he stated that because of their wide experience and technical know-how the influence of these men is unquestionably of great significance.

Going into detail on the dealer's position in mer-



chandising chemicals he said, "The local dealer's influence is much less intense. A very high percentage of our dealers simply follow the state guide and carry in stock one or more brands of the type of material recommended in the guides."

At the retail level, F. W. Jones represented the thousands of local dealers. He stated that he doubted very much in the final analysis how much farmers rely upon what the ads and other mass media state but rather upon the advice their local dealer can offer.

He continued, "The farmer is interested in what the man that takes his money, the man who speaks his language, the man who dons his overalls and goes out into the cotton fields and helps him with his insect problems, what that man thinks about this or that kind of insecticide and the opinion of that man, honestly and thoughtfully given, will nine times out of ten influence his buying."

Highway Program

Discussing the Federal highway program and its effect upon the industry, panel members from various segments of chemical, highway construction and maintenance industries expressed their thoughts on potential effects of this program.

Members of the group, moderated by Jack Dreesen, NAC herbicide specialist, were W. C. Greene, Connecticut State Highway Commission; H. F. Clemmer, American Road Building Association; R. J. McMahon, president, McMahon Bros., Inc., Binghamton, N. Y.; and Dr. C. O. Eddy, Niagara Chemical Div., Food Machinery & Chemical Corp.

Greene mentioned that if it "were not for the valuable chemical tools found in pesticides, the present day highway landscape engineer would be almost utterly lost." Continuing, he stated that the job of the landscape engineer is to develop and maintain landscaped roadsides as economically as possible. In meeting this end, "It is now possible to accomplish a better job more economically with these chemicals." An indication of the trend towards chemicals was made when he mentioned that in ten years 60-70 per cent of all highway maintenance will be carried out with chemicals.

"With proper and selective application of these chemicals and the eradication of herbaceous weeds, we improve our turf, increase the efficiency of our mowing equipment, and improve the aesthetic appearance of our highways. This, in turn, is a very important economic factor."

Greene held high hope for the use of growth inhibitors and growth regulators which would control the height to which grass will grow. "It is our contention that with the development of these chemicals that are now progressing through research, we will be using them very extensively in the future," he said.

R. J. McMahon stated that "in Steuben county,

New York, the entire county highway system of 700 miles has, during the past three years, been made progressively safer and more beautiful at an annual cost of \$20,000, whereas prior to the chemical program, an annual expenditure of \$65,000 was losing the battle to vegetation, with highways growing even more hazardous and unsightly. Yet, in the face of proven economy and benefits to health and agriculture, not 10 per cent of the highways of our country are now under chemical control." He reasoned that part of this low acceptance was due to early abuse in the application of chemicals as well as faults in the chemicals themselves.

Quoting from insurance publications, he said that "9 per cent of all fatal highway accidents are caused



Maleic hydrazide is applied along roadside to slow growth of grass and reduce expense of hand mowing.

by obstructions along roadside. The cost of these particular accidents to insurance companies was \$270 million in 1955. The additional cost to those to whom these accidents occur cannot even be estimated." In conclusion, "Vegetation control along highways may be infinitely better done by chemical means than by other existing means at half the present cost of such other means."

The chairman of the Chemicals Subcommittee, American Roadbuilders Association, Dr. C. O. Eddy outlined some of the principles and objectives of the subcommittee: "To expand the use of chemicals to secure safe, beautiful and healthful highway areas while reducing maintenance costs and promoting roadside conservation practices."

"Unfortunately," he said, "most of the highway officials who were aware of the virtues of herbicides in highway maintenance became more conscious of problems they created than the ones they solved.

The chemicals were intrinsically hazardous; application was not suited to roadside work."

On speaking of committee activities, he stated, "We on the committee think that one of the activities that should be emphasized very soon and in which we need much more support than we have at the present time, is the program whereby the wide and expert knowledge of our members and associates is utilized in any research and development project growing out of funds available under the new highway plan. Certain funds in these appropriations can be set aside for research and development if it is known the money is needed and if expert knowledge and service is available for its utilization."

According to Clemmer, over one million acres will be subject to landscaping. "The design policy followed for the interstate networks will undoubtedly be reflected in the other state and county systems," he said.

Members discussing the Miller Bill included Moderator L. S. Hitchner, secretary, NAC Association; W. B. Rankin, Food and Drug Administration; J. T. Coyne, USDA; Dr. G. C. Decker, Illinois Natural History Survey; and J. A. Noone, NAC Assn.

In presenting his talk, W. B. Rankin outlined eight principles in the establishment of tolerances for pesticide chemicals.

1. There should be an analytical method which permits the determination of the residue. It should be a method that can be employed by regulatory officials to test food crops.

2. There should be evidence to show the amount of residue that remains when the pesticide is used according to proposed directions. This evidence should establish the residue that may remain under conditions most likely to result in high residues.

3. The tolerance level established should be one that can be met when the user applies the pesticide according to proposed directions.

4. There should be evidence about the chemical effect of the residues when they are fed to test animals. This should permit a reliable estimate of a feeding level that will cause no effect in the test animal.

5. The tolerance level established for residues on human food should provide a safety factor; that is, we should not tolerate residues on human food that would cause injury on test animals. (As a broad guide we have considered a safety factor of 100 to be suitable for tolerances in foods other than mills but this figure depends upon the amount and type of evidence available.)

6. If the quantity of pesticide that may be contributed to the diet from all sources, including that derived from residues on food, exceeds the quantity estimated to be safe, the tolerance should be set so that the point of estimated safety will not be exceeded.

7. If the total quantity of the pesticide that may be ingested from all sources does not exceed the quantity estimated to be safe, the tolerance should be based on the quantity of residue which is needed to permit useful employment of the pesticide in agriculture.

8. Where two or more pesticides have a related or cumulative effect on man or test animals, the tolerance should be set so that the total allowable residues for all such related compounds will not exceed a safe figure.

Further on in his presentation he discussed temporary tolerances and gave their definition and meaning. "The temporary tolerance procedure is one to reduce the cost of large scale experimental work on a new pesticide. It permits the marketing of produce treated with the new chemical, provided the residues are within the temporary tolerance level, i.e., the level temporarily judged safe."

Another member of the USDA, J. T. Coyne, discussed recent developments in the Miller Bill, the most significant being the USDA's new pesticide residue survey. This has been initiated to determine the status of every food or feed use now registered under the act. The various uses are being compiled on a chemical-by-chemical basis. The tabulations of registered uses list the more common formulations of the chemical, tolerance established for each crop and the customary dosage ranges.

He went further in discussing clarification between registration and certification of usefulness, which many people misunderstand as being one and the same. He said, "The criteria for registration are not all applied in considering the certification of usefulness and the fact that such a certification has been made does not mean that the economic poison can always be registered for the uses concerned."

Dr. G. C. Decker discussed the various accomplishments of the bill. He stated that (1) In the first place, it has given us a set of guideposts so that now we are in a better position as to where we stand; (2) that undue delay will be at a minimum on securing tolerances on the basis of additional data; (3) that protection is offered from possible unjustifiable rulings by a panel of scientific experts to resolve disputes; (4) that now, instead of the previous evidence of necessity for use, we have a certification of usefulness which provides some assurance that performance data will be reviewed and passed upon by an agency in which the majority of the staff have a working knowledge of agricultural practices and problems.

A member of the panel and also on the NAC staff, J. A. Noone stated that recently a survey had been conducted of the manufacturers and that a seminar between industry and government is being planned. It is hoped that various mutual problems will be discussed and corrective measures found between the two groups. ▲

LPG...

Good or Bad For Materials Handling

By Russell Hastings
Clark Equipment Co.

THE advantages claimed for liquefied petroleum gas as a fuel for industrial fork lift trucks have focused a great deal of attention on this subject in recent months. But while the number of LPG users is growing steadily, an even larger number of men concerned with materials handling have considered the use of LPG but are deferring decisions regarding it because of inadequate information or a lack of understanding as to how the advantages of LPG can be applied to their specific handling problems.

What Is LPG?

Liquefied petroleum gas is gas kept in a liquid state by pressure. LPG can be either Propane or Butane but is usually a mixture of the two. Its chief source is natural gas, from which LPG is condensed out as a by-product. Large quantities are also produced by oil refineries as a by-product of gasoline production and additional amounts, previously burned off as waste, are now being realized from crude oil wells. LPG is measured in pounds: 4.46 pounds equal one gallon of gasoline.

Characteristics of LPG

LPG has certain characteristics which distinguish it from gasoline. Some of them are propane boils at minus 44° F., while butane boils at 33° F. (It is because of this decided difference in vaporization temperatures that the two gases are usually mixed. Butane alone, for example, would not be effective in sub-freezing temperatures.) At various temperature levels the two materials differ; at 100° F. propane develops 172 pounds pressure while butane

develops 38 pounds pressure. Octane ratings vary for the two materials; propane is rated at 100 while butane is 93.

These characteristics require different construction for engines using LPG when compared with gasoline engines. Due to the higher octane ratings of LPG, a higher compression ratio from 8 to 1 to 9 to 1 is used to obtain fuel economy.

A cold in-take manifold is used with LPG since the fuel is a gas when it enters the manifold and does not require a hot spot to help vaporization, required when gasoline is the fuel. A simple air gas carburetor replaces the complicated, delicate gasoline carburetor. Since LPG is liquid only when under pressure, a fuel tank capable of withstanding high pressure is necessary.

What Are The Advantages of LPG?

Longer engine life resulting from use of the material is probably the principal advantage of the fuel. Operating characteristics of LPG result in reduced engine wear, when compared with gasoline operation, and thus effect lowered engine maintenance costs. Just how this is accomplished is illustrated by the following points:

LPG enters the combustion chamber as a gas rather than as a vaporized liquid, thus insuring almost complete burning. Unburned carbon deposits, commonly found with gasoline, are almost entirely eliminated.

The high octane rating allows clean burning, thereby eliminating lead compound deposits in the combustion chamber. LPG is completely free of materials that cause varnish deposits.

The simple carburetor has no jets or other mechanisms that require maintenance and adjustments usually necessary with a gasoline carburetor.

No fuel pump is required because the gas is under its own pressure in the tank.

In most installations, lowered fuel costs are realized with LPG but this largely depends on geographic location. Generally speaking, LPG costs less than gasoline in the western, mid-western, north-central and Gulf states. In these areas, lower fuel costs will





Individual LPG fuel tanks are filled in a shed next to the bulk storage tank. A device on the scale shown here automatically shuts off the flow of gas when the weight of the tank reaches 33½ lbs. net. LPG is measured in pounds; 4.46 lbs. equal one gallon of gasoline.

reflect especially substantial savings in fleet installations, where fuel costs make up a large portion of the total operating cost.

Buying in bulk rather than individual tanks increases savings in the cost of fuel, but necessitates the purchase and installation of storage facilities. Whether such action is economical depends on total fuel consumption.

What about fumes?

The small amount of fumes produced by LPG combustion are colorless, odorless and harmless—a factor which can be of considerable importance in certain instances. Because of the almost complete burning of the fuel, exhaust fumes are produced to a much less extent than with gasoline engines. Carbon monoxide, the most harmful ingredient in gasoline engine exhaust fumes, is contained in LPG fumes in only minute amounts due to the high volatility of LPG. For the same reason, odorous aldehydes which give gasoline fumes their obnoxious smell are nonexistent to any traceable degree in LPG fumes.

Is LPG safe?

Much has been said, and misunderstood, concerning the safety of using liquefied petroleum gas. Its characteristic high volatility, and the fact that it must be kept under high pressure, have occasioned some misgivings about the possibility of explosions and other accidents. In some cases, these doubts have been strong enough to decide against use of LPG.

There is an "accident potential" in any fuel, LPG not excepted. But experience has proven beyond question that there is no more danger in use of LPG than there is with gasoline, or even diesel fuel, when normal safeguards and good maintenance procedures are utilized.

Well engineered components are essential for safety. Fuel containers must comply with local regulations concerning the use of the gas. The tank should be equipped with a safety-relief valve which

by-passes excess pressure. It is mandatory to have on the tank an excess flow valve which automatically shuts off the flow of gas if the flow is too fast, which might occur if a coupling or hose is broken. Fuel systems should be completely sealed to eliminate fuel leakage or evaporation. Quick-disconnect, self-sealing couplers are important in that they help prevent gas leakage during tank changeovers.

Since LPG is an odorless gas, LPG manufacturers add an odorant to aid in the detection of gas leaks. Often this odor is found in the exhaust fumes and is ignored because it is considered natural. This is a mistake. Odorous exhaust fumes indicate that the odorant is not being burned completely, probably because the fuel mixture is too rich. This should be corrected immediately, not only for more efficient engine operation, but also because the fume odor might prevent detection of a similar odor resulting from a gas leak from the tank or hose couplings.

While a gas leak is potentially dangerous, by no means does it indicate an imminent explosion. To illustrate, let us assume that a tank valve has been damaged, resulting in a slow, steady leakage of gas. Ordinarily, the leak would be detected either by the odor or by the sound made by the escaping gas. But in this case the leak has not been noticed, and an open flame is accidentally directed to the gas flow.

The result would not be an explosion but a tongue of flame extending out from the valve, much like an acetylene torch. Length of the flame would depend on the pressure behind the gas leak. While the flame itself might cause damage or injury, there would be no explosion damage.

Such a leak might result in an explosion if the leak were undetected long enough for a sizeable amount of gas to collect in a closed, unventilated area, such as the bottom of an elevator shaft, and then be ignited. While such a situation is possible, it is highly improbable if the LPG equipment being used is well constructed and in good repair.

Some gas usually escapes when fuel tanks are changed, but even this harmless amount can be reduced or eliminated with proper techniques. The shut-off valve on the tank should be completely closed during this operation. After the valve is shut, the fork truck engine should be run till it stops, thus using all fuel remaining in the fuel system. This relieves pressure on connecting hoses leading from tank to metering device. If this procedure is followed correctly, there will be no "phfft" of escaping gas when the tank is removed.

Most communities have local ordinances governing the use of LPG, and the first-time user of this fuel should consult these rulings to make sure his operation is within regulations. Usually, these codes demand that the gas be stored in an open area away from general plant activity.

Factory Built Or Conversion

Some fork truck owners may not know that it is not necessary to purchase a machine factory built for LPG operation to gain the advantages of this fuel. Most fork lift trucks now using gasoline can be converted to LPG operation at a reasonable cost. While some owners have purchased the kits to make conversions in their own shops, most prefer that the work be handled by the fork truck dealer because of the complexity of the job. Owners of large fleets of fork trucks planning conversion find it advantageous to have their own mechanics learn how to make conversions.

Successful conversion depends on good workmanship and quality parts, so the fork truck owner will be wise to insist on these requisites. Minimum conversions or short kit "spud-ins" not widely recognized or approved, or their components, should be avoided. All components used in conversion should have Underwriters' Laboratories approval if the user hopes to obtain reasonable insurance rates. When converting, it is wise to inform the fire insurance company to make sure that use of LPG does not alter insurance rates.

Conversions of fork trucks to LPG should be made only on engines in top-notch shape. It is especially important that pistons, rings, valves and cylinder head are clean and free of carbon deposits. Gasoline, which causes carbon deposits, also acts as a solvent in keeping the deposits from becoming highly abrasive. LPG does not have this solvent effect, but tends to harden the residual carbon into a very abrasive substance. Therefore, a good overhaul, or at least a thorough cleaning, is necessary preparation for a proper conversion. For this reason a conversion usually will be done most economically at a time when the fork truck is normally due for an overhaul.

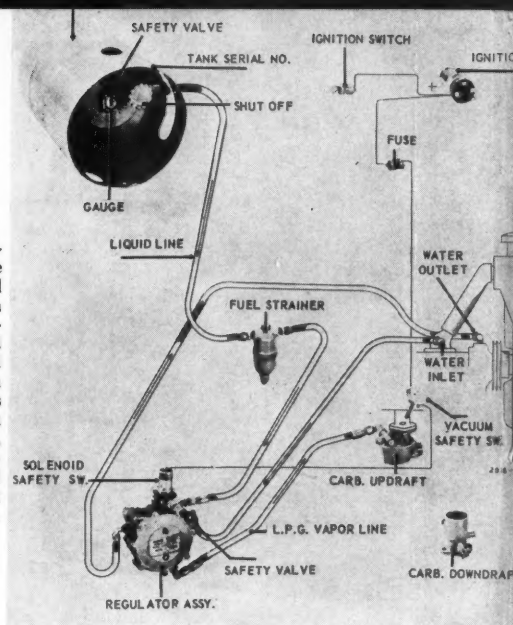
Since LPG, because of its high flame temperature, has a tendency to burn conventional valves, it is advisable to install stellite-faced valves and seats and positive valve rotators in the converted engine.

Where Can LPG Be Used?

A common misconception concerning use of LPG powered fork trucks is that they are applicable only in very specific or specialized situations in which gasoline or electric-powered trucks are not practical for some reason. But the combined advantages of LPG make it a fork truck fuel that can be utilized in any installation, a fact proved by the experience of users in a wide variety of applications.

For example, the Douglas Aircraft Company recently published the results of a test made to determine the comparative advantages of propane and gasoline as fuels for fork trucks and towing tractors used in the plant. Using four towing tractors and

The sketch illustrates the simple fuel system of a fork truck engine powered by liquefied gas. Main components are the high pressure tank, vaporizer-regulator and downdraft carburetor.



two fork trucks as a test group, the company operated half the machines on LPG and half on gasoline for five months, carefully noting such factors as fuel consumption and maintenance costs. Results of the test are shown in the accompanying table. Douglas projected the savings on an annual basis covering all of its 103 handling units and estimated that a fleet-wide switch to LPG fuel would save \$9560 a year.

Douglas Aircraft Co. Test Results				
	Industrial Tugs		Fork-Lift Trucks	
Per Engine Hour	Propane	Gasoline	Propane	Gasoline
Gallons of fuel	0.471	0.485	1.046	0.776
Fuel cost	\$0.333	\$0.086	\$0.073	\$0.138
Fuel and combustion system maintenance cost	\$0.007	\$0.015	\$0.010	\$0.030
Total cost	\$0.040	\$0.101	\$0.083	\$0.168
Saving	\$0.061	...	\$0.085	...

Some examples of the outstanding results in converting to this new form of fuel can be cited by a company long familiar with LPG as a fork truck fuel. They converted a truck several years ago and report that the unit operated 8000 hours before an overhaul was necessary, and that even then the parts required cost only \$35. Similar machines operating on gasoline required rebuilding at 2000 hours with parts and machine work costing \$250.

Some time ago a company converted six of its 16 fork trucks at a cost of \$1410. Seven months later the plant superintendent reported that the conversion saved at least \$1800 in reduced maintenance and repair bills. Maintenance costs on the six LPG powered trucks were lowered 50 per cent; hourly fuel consumption on one carefully watched fork truck dropped from 1.7 gallons of gasoline to 1.3 gallons of LPG; oil filters last at least three months instead of being changed every two weeks. ▲

IRON CHELATES

A Really Big Market Lies Untapped; Chelates Reasonably Priced and Effective on Alkaline Soils are Sorely Needed

THE use of iron chelates for correction of iron chlorosis in plants is increasing each year; however, the really big potential market as yet remains untapped. This market lies on the alkaline soils, of which many thousands of acres are found in states west of the Mississippi, along Florida's east coast and in many countries throughout the world. An iron chelate suitable for these soils and reasonably priced could be marketed over a vastly wider area than are the chelates being used today on acid soils.

Citrus Industry Largest Consumer

Iron EDTA, the first chelate to be used commercially in agriculture, was developed for Florida citrus trees where iron chlorosis caused extensive damage. Florida citrus growers continue to be the chief consumers of this chelate, using above ½ million pounds per year while its use in other areas is increasing. Iron EDTA is an excellent iron fertilizer on acid and neutral soils such as those that occur in central Florida, but it has not proven satisfactory on alkaline soils. In alkaline soils the iron is removed from FeEDTA to form the very stable compound, iron hydroxide, which is a very poor source of iron for plants.

The success of the presently known chelates has done much to stimulate research in the field of plant nutrition by many of the large chemical companies previously engaged primarily in developing insecticides, fungicides and herbicides. Because of the

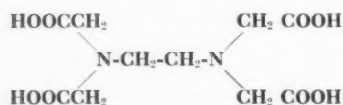
potential stake involved, only a limited amount of information is being disseminated by the manufacturers as to the types of chelates being investigated.

Development of Chelates

Some of the first developments in the field of new chelates came from studies to determine the chemical structure required for the stability of iron chelates in soils. The basic structure required for chelates used in acid or neutral soils as a source of iron has been the alkyl polyamine carbocyclic acid type (Fig. 1). Compounds that are similar to EDTA but contain only one amine group like glycine, iminodiacetic acid or hydroxyethyl iminodiacetic acid (Fig. 2) are readily decomposed in the soil by micro-organisms and hence these chelates are poor sources of iron for plants.

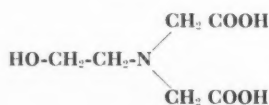
EDTA forms a very stable chelate with iron and there has been much speculation as to whether it could be improved. In order to determine this, the first step was to study the stability of EDTA derivatives in the soil. One hydroxyl group in EDTA was substituted for a carboxyl group (Fig. 3) and although this actually decreased the stability of the chelate as measured by chemical methods in the laboratory, it did prove to be somewhat more effective as a source of available iron for plants growing in calcareous soils than did FeEDTA. However, when two groups were substituted giving dihydroxyethylethylenediaminediacetic acid, the results were no better than the original chelate. Other combinations with iron that have been tried are diethylene-

Figure 1



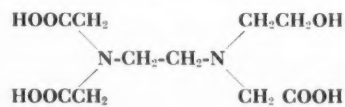
Ethylenediaminetetraacetic Acid

Figure 2



Hydroxyethyliminodiacetic Acid

Figure 3

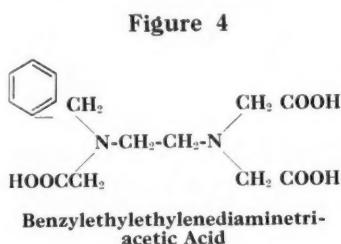


Hydroxyethylethylenediaminetriacetic Acid

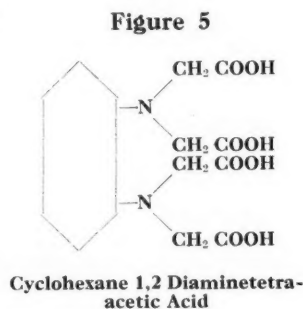
triaminepentaacetic acid (DTPA) and isopropylene-diaminetetraacetic acid. In Florida the results of studies with these two chelates have varied, but in general, they have not proved to be any better source of iron than FeEDTA. However, in some western states considerable DTPA has been used the past two years.

Ring Substitution An Aid

Chelates have also been studied with one and two benzyl groups substituted for COOH-groups in the EDTA formula. When one substitution was made



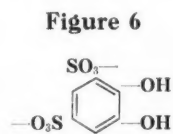
plants. Another use of ring structure is cyclohexane 1, 2 diaminetetraacetic acid (Fig. 5). This forms a very stable chelate but apparently is not readily absorbed by plants growing in calcareous soil. It is, however, a fair source of iron for plants grown on acid



broken down within a few days.

Recent Work Encouraging

The most recent advance in the field of chelation has been the development of phenolic derivatives of



EDTA. It has been known for some time that the phenolic oxygen can form a powerful complexing group. But because the oxygen is attached to a ring it is difficult to construct other groups in such positions that they will form a complex with iron. In recent months this problem has been solved and experimental amounts of these chelates have been made. These aromatic chelates remain stable

(Fig. 4) the chelate behaved similarly to EDTA in the soil but when two COOH-groups were replaced the chelate was much less effective as a source of iron for

soil. Another compound that forms a very strong chelate with iron is 3, 5 disulphyrocatechol (Fig. 6) and in the laboratory will keep iron soluble in the presence of excess CaCO_3 for long periods. However, in the soil it is

for several months and are excellent sources of iron for plants growing in calcareous soils. But, because of the present methods of manufacture they are considered too expensive for commercial use. Again, these new chelates contain the basic alkyl polyamine carboxylic acid groups with the phenol groups being substituted. They do not constitute any radical change in structure from EDTA, but represent a vast improvement in properties needed for use on calcareous soils. They are less effective than FeEDTA on acid soils.

Foliage Problems Equal Soil

The problem of finding a source of iron suitable for spraying on the foliage of plants has been as complex as finding a source to apply to the soil. To date most of the sources used for sprays are not readily absorbed by a wide variety of plants.

Iron sulfate has long been sprayed on pineapples, grass and other plants, but applications must be repeated often and it readily causes burn. Iron EDTA as a spray has few advantages over the much cheaper iron sulfate and can also cause burning of leaves. Iron oxalate is the only chelate that is being used commercially as a spray. Although it is not absorbed by citrus and many other crops, it has been found useful on lawns and some vegetables.

Further Investigation Needed

The most recent development in the use of sprays is a report made by the Stauffer Chemical Company that triphenyl sulfonium chloride combined with iron chloride brought about the greening of iron chlorotic leaves on several kinds of plants. This combination has not been studied sufficiently to determine its value as a source of iron for plants.

Studies are being carried on with chelates, other than those of iron, in an effort to find better sources of nutrients for plants. In Florida and California all the zinc supplied to citrus trees is sprayed on the leaves, and in many areas manganese is applied in the same manner, since soil applications are not effective. Known chelates of the above-mentioned are not sufficiently stable in the soil to be good sources of nutrients for plants, and further studies are in progress to solve these problems. ▲

By Ivan Stewart and C. D. Leonard

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Lake Alfred, Fla.*

Air Blasting Fertilizer

TO help in the establishment and maintenance of roadside vegetation on our highways a new efficient method of fertilizer application has been developed. Air blasting—a new technique—is proving to be a fast, simple, low-cost method of plant food application along miles of highways.

On July 1, congress passed the multi-billion dollar highway construction bill giving the green light for some 41,000 miles of roadway. Under the program the Federal government will pay 90 per cent of the cost, with states contributing 10 per cent.

Protecting this investment is of major importance, and appropriations have been established to provide for the coverage of these roadsides with turf. Water, greatest enemy of highway longevity, allowed to stand may eventually seep into the cracks between sections, undermining the road surface. Water run-off from hillsides will eat into the road's sub-surface, causing the pavement to drop. Highway authorities looking for a means to prevent run-off began checking into the possibilities of low cost roadside vegetation. When treated with fertilizer, this protection is in better condition to check destructive water erosion by eliminating run-off.

E. M. Davis, of the U. S. Soil Conservation Service and pioneer in air blasting fertilizer, says that "fertilization of roadside vegetation is a protection, or form of insurance, on the tremendous investment of highway construction. There's no question about it. Grass won't continue to grow indefinitely on

roadsides without help. Satisfactory fertility levels are a 'must'. We've been looking for a long time to find an economical means of fertilizer application, and I think we've found one in air blasting."

Experiments with air blasting began back in 1937. Maryland was studying efficient means of keeping highway areas in top condition. Today, thick mats of sod testify to the effectiveness of the study. Development of air blast fertilizer applications was partially responsible for the program's success.

Though still in its infancy, air stream distribution is proving it can save time and labor—big items in cost reduction. The air blast method requires only a few feet of rubber hose, an air compressor, a rather simple feeding system and truck-mounted applicator. Ordinary sand blasting equipment has been proven adaptable; however, the new gun is specifically designed for fertilizer air blasting.

S. W. Baumiller, landscape engineer of the Maryland State Roads Commission, says that according to recent experiments using granular fertilizer, it has cut costs considerably not only in material and labor but also operation time. He said, "We calculate that by using 12-12-12 for maintenance, our two-unit system can cover 60 roadside acres in an eight-hour day. However, the equipment operates faster than our crews can handle it, so we figure on about 50 acres a day. Cost of labor and equipment per day acre is \$1.27, for 50 acres \$63.25."

Maryland uses a gravity supply hopper, but New York state crews experimenting with granular fertilizers on the New York Thruway have found that the intake pipe can be placed directly in the fertilizer bag. Maryland also frequently uses two units in tandem. One applicator fires low and close, the other high and far. Three men operate the units besides the truck driver; two operate and a man to fill the hopper.

The New Jersey Turnpike Authority has studied air blasting, and October applications showed up significantly in January in the form of deeper rooted, lusher grasses. On the West Virginia turnpike Arcadian 12-12-12 was used with water and pumped under pressure through a nozzle to the road side. Seed was included in the fertilizer-water mixture. ▲

New Jersey Turnpike crew air blasts granular fertilizer to an embankment near the Swedesboro interchange. Soils in the area are very sandy requiring maintenance fertilizer; here 12-12-12 is applied.



From an article in the June, 1956 issue of NITROGEN DIVISION LIFE, Allied Chemical & Dye Corp.

**Election of officers
and varied speeches
on agenda for NSC's**



H. B. DeVinny



H. S. Baucom

Fertilizer Section Meeting

THIS month, about 12,000 safety-minded individuals will meet in Chicago to attend the National Safety Congress, running from October 22 to the 26th, headquartering at the Conrad Hilton hotel.

Fertilizer Section meetings, to be held on Oct. 22 and 23 in the La Salle hotel, will be opened by Curtis A. Cox of Virginia-Carolina Chemical Corp., general chairman of the section, after which officers are to be elected for 1956-57.

H. B. DeVinny, Davison Chemical Co. director of industrial relations, will then address the group on "Safety is Top Management's Concern."

The section's public relations chairman, J. Lauren Shopen, safety director of Consumer Co-op Association, is scheduled to speak on "The Safety Director in a Multiple Unit Organization."

"The Safety Committee in the Plant" is the topic of C. S. Griffith, superintendent of Virginia-Carolina Chemical Corp. at Cincinnati.

A luncheon is planned for October 23 in the Century Room of the LaSalle Hotel. Speaker for the affair is H. S. Baucom, safety director, North Carolina Industrial Commission, on "Safety Program for the Average Plant."

"Florida Cooperates—Not Regulates Work with Your State Department," is the interesting title of a talk to be presented by C. E. Hooks, Jr., principal safety representative of the Florida Industrial Commission.

Charles J. DeWitt, assistant division manager, Loss Prevention Department, Liberty Mutual Insurance Company, will tell delegates "How Electrical Accidents Occur and How They Can Be Prevented," followed by Glenn F. Griffin, director of industrial training, National Safety Council, who will explain "How to Conduct a Safety Committee Meeting."

Time has been set aside for discussion following each presentation. ▲

C. J. DeWitt

G. F. Griffin

C.S. Griffith

C. E. Hooks, Jr.



Helpful Aids And Suggestions for Selecting

TRADEMARKS

By Milton E. Abramson

Examiner of Trademarks

U. S. Patent Office

WHEN competition stiffens, the battle for consumer favor calls for the most careful planning and marketing. Competition in the field of farm chemicals—fertilizers, soil conditioners and pesticides—is as keen as it is in any industry. In a free, competitive economy such as ours the marketing plan of any company must include one or more trademarks which the purchasing public must be educated to accept.

The choice of a trademark, then, becomes one of the first steps in any marketing plan. For obvious reasons it is necessary to exercise great care in the trademark selection. When a mark is finally adopted, good hard cash is spent to advertise it. Bags, invoices, order blanks and stationery are printed prominently displaying it. Sign painters are employed to apply it to the warehouse, plant and office. Often it is the sole message on delivery trucks. All in all, a good deal of time, effort and money is invested to encourage customer acceptance of the new mark. And it is time and money well spent since the trademark often is the only way customers identify goods when reordering.

On the other hand, the haphazard choice of a trademark can lead to disappointment. The mark can be ineffective in operation or lost by court order. In either event the money and the time and the effort to encourage customer recognition of the mark can never be retrieved. Yet such disappointment can be largely avoided. An attempt is made here to state some existing dangers and how to avoid them.

First, let's make sure we know what a trademark



U. S. Pat. Off. Reg. Nos. 251,208; 617,030
owned by Allied Chem. & Dye Corp.

is. A trademark is a word or symbol used by a dealer in goods to identify those goods and to distinguish them from those of his competitors. It is not a patent which secures to an inventor the exclusive right to make, use and sell an invention. Nor is it a copyright which secures to authors, composers, artists and others the exclusive right to publish and dispose of their works. The trademark is a merchandising shortcut by which a purchaser identifies a product of a manufacturer or dealer.

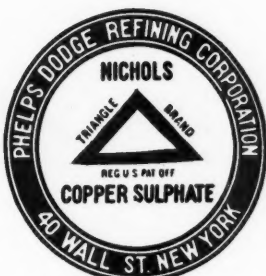
To you, a business man, the most important function of a trademark is to distinguish your goods from the goods of your competitors. Therefore, when you select your mark it must not be confusingly similar to any mark used by your competitors on the same or similar kinds of goods. If you do choose a mark which is similar or identical to your competitor's mark, it is not only possible that your customers will buy your competitor's goods by mistake, but you may be sued as an infringer. In addition to a possible award of money damages, your competitor can stop your use of the mark. To add to the injury he may also reap the benefit of your advertisement of the brand name. Be sure, when you finally choose your mark, that it can mean only your goods and no other.

Trademark Searching

Before you finally decide to adopt a mark search the recesses of your memory. Did you ever see the mark or anything like it in the trade literature or advertisements of competitors? Your investigation should include associated items as well as competitive items: For instance, you should consider similar marks used in plant sprays and soil conditioners which are similar to the one you intend to use on fertilizers; or, if you intend to use a new mark on an herbicide, you must consider similar marks used on fertilizers. If you do not recollect a mark similar to the one you intend to adopt go a little further and search the trademark records of the United States



U. S. Patent Office Reg. No. 500,123
owned by Monsanto Chemical Corp.



U. S. Patent Office Reg. No. 104,695
owned by Phelps Dodge Refining Corp.



U. S. Pat. Off. Reg. No. 399,091 owned
by International Min. & Chem. Corp.

Patent Office in Washington. If you can't get to Washington, you can retain the services of an experienced attorney who specializes in the law of trademarks to make the search for you. Remember—the law places the burden on you to avoid the use of a trademark which is identical or confusingly similar to one chosen by your competitor.

Wording Important

Choosing a mark which is confusingly similar to one used by your competitors is only one of the dangers involved in the selection of a mark. There are other pitfalls to avoid. For instance, a word which is merely descriptive of the fertilizer or pesticide to which you will apply it as a trademark should not be adopted as the sole or principal feature of your mark. A descriptive word may specify the purpose of a fertilizer such as MOR-FERTIL (more fertile). Or it may describe some characteristic of a pesticide such as GRUB-SPOR (grub spore). Additional examples of words which should be carefully considered before they are adopted are "activated" for contact sprays, and combinations with "dust," "spray," "liquid," etc. for either pesticides or fertilizers sold in these forms. Similarly, caution must be exercised when choosing a mark which is geographically descriptive. Though few geographical areas have yet become so thoroughly identified with the industry that they would be held geographically descriptive, expert advice should be sought before you put up hard cash to promote such a mark. These descriptive words cannot be exclusively appropriated by any one manufacturer or dealer. And all these words may be used together with another valid trademark.

Distinctive Trademarks

Under certain conditions, descriptive words and geographically descriptive designations can become distinctive of your goods and they will be protected by the courts. The process whereby a trademark becomes distinctive is clothed in legal technicality and discussion on this point would be too lengthy for

inclusion here. But be mindful! Unless you are sure you understand these points of trademark law you will be wise to secure expert opinion before you adopt such marks.

A small number of manufacturers of fertilizers and pesticides have displayed a tendency to compose trademarks with prefixes or suffixes which suggest the purpose or character of their products. Popular prefixes and suffixes include "fertil," "kil," "rid," and so on. The courts have constantly approved the use of such prefixes and suffixes as parts of arbitrary words and some have gratuitously praised the "suggestive" marks thus coined as the best kind of mark. But, at the same time, the courts have held that such prefixes and suffixes are in the public domain because of their meaning and can be used by any producer or dealer as part of his trademark. With this in mind, considerable thought should be given to the necessity of choosing a mark which includes these over-worked prefixes and suffixes.

Using Surnames as Trademarks

Surnames as trademarks—even your own—offer problems too. On the theory that others are entitled to use their own names, the courts often give limited

AUTHOR'S NOTE

Although over 600,000 trademarks have been registered in the United States Patent Office, there is still a very large segment of the business community which is completely unaware of this service.

In the course of examination of many applications to register trademarks owned by manufacturers and dealers in fertilizers, soil conditioners and pesticides, the author has had opportunity to note the principal difficulties experienced by businessmen in the selection and use of their trademarks. The author has set forth in this article some of the more compelling reasons for the failure of trademarks together with suggestions to avoid such failures.

The views expressed in the article which follows are the author's own. It should be understood that the Patent Office neither approves nor disapproves what is stated.



United States Patent Office Reg.
No. 394,062 owned by International
Minerals and Chemical Corporation



United States Patent Off. Reg. No.
306,280 & 577,317 owned by American
Potash and Chemical Corporation

or no protection in suits for infringement of this kind of mark. Yet some famous American trademarks are surnames. Who is not familiar with Johnson's wax, Smith Brothers cough drops and Campbell's soups? These names have become so well-known on the products on which they are used that they acquired a secondary meaning in commerce; that is, they have become distinctive of the goods to which they are applied. Once a mark has become distinctive it merits complete protection by the courts.

Names For New Products

But before you adopt a surname as a trademark be sure you are willing to wait until the name has become so well-known that there can be little doubt it refers only to your product. At that time you can stop others from using the same name as a trademark—even those whose own surnames are identical to your mark. But you will still not be able to stop anybody from using his similar or identical name in the usual course of business.

The utmost care must be exercised in selecting a trademark for a newly discovered product. Very often the inventor or promoter of a new item selects a word or words as a trademark for the new product only to find later that the entire trade has appropriated the notation to designate the item—in other words, as the name of the goods. Once this has happened, it may be said generally that it is impossible to recapture the notation as a trademark. Trademarks which were lost to their owners in this way to become generic designations include "cellophane," "linoleum," "escalator," and "aspirin." Money invested in their promotion must be written off as a loss. To avoid such disappointment, a carefully laid plan must be followed.

The plan is neither a difficult nor an expensive one. The investment is mostly one of a little mental energy and a little time. The plan is simply this: First give the new product a name, and second, choose your trademark. Unless you first give your new product a name you will likely find your trademark slipping away from you and into the realm of a generic designation.

Once a new name has been selected for your new product it would be wise to publicize it. Such publicity is secured through articles and advertisements in trade magazines and reports in learned journals. And, at least during the period when the new item is being introduced to the public, your own literature should refer to the new product by its chosen name. This will prevent nuisance caused by those few unscrupulous persons who attempt to appropriate new names of products before they become well-known as their own trademarks.

After your name for the new product has been chosen you have a task which is a little more difficult but not without solution. That is, you must choose your trademark. You must be careful to avoid all those pitfalls already mentioned. You must be careful to select a mark which will not confuse a purchaser as to whose goods he is buying. You must use care not to choose a word or words which other producers or dealers have a right to use when they advertise or just talk about their goods. You must not use a word which is misleading. And you cannot exclusively appropriate the name of a new item as a trademark even if you originated it.

In English-speaking countries a word or symbol cannot be protected as a trademark until it has been used as a trademark. Merely intending to use it or using it in a manner which is not recognized as trademark use gives you no right to court protection.

The trademark law requires the mark to be used on or in connection with your goods. It can be printed or impressed directly on the goods or printed on the containers in which the goods are shipped. Your trademark ownership begins when used as such.

Proper Registry Counts

A mark used in unconventional ways may or may not be accepted by the courts as sufficient to create a trademark right. For instance, use of the mark on trucks and barges should be a supplementary one. Your mark on truck sides and tailgates certainly advertises it, but in at least one court suit the use of a mark on delivery trucks has been held to be inadequate. Printing the mark on letterheads, order

blanks, invoices and advertisements in newspapers have been definitely rejected as evidence of the requisite trademark use.

Use Of Your Trademark

These latter uses will bolster your claim, but it is not trademark use on or in connection with your goods. The mark must be used physically on or in connection with the product when it is moved in commerce and delivered to the purchaser. It must be affixed so that the purchaser can see it and presented so that there can be no doubt that it is the trademark for your goods.

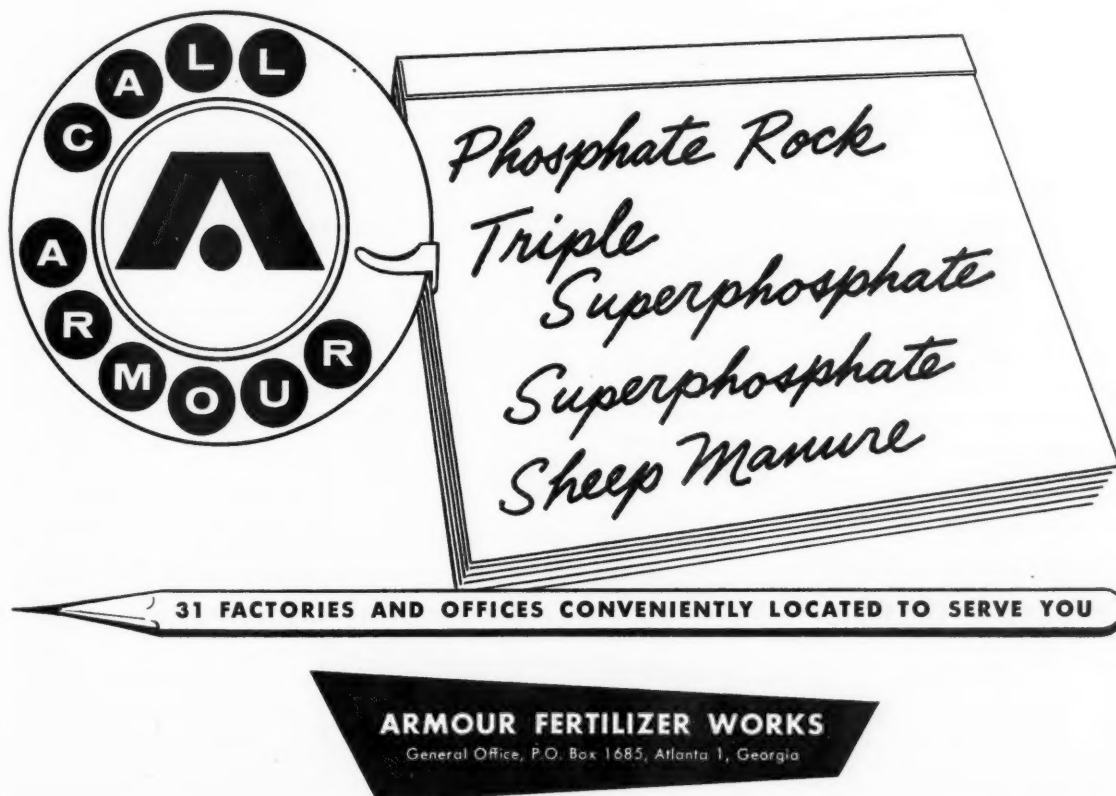
When you have selected your trademark and properly used it, you should consider the desirability of registering it with the appropriate state agency, or if you are using the mark in interstate commerce or other commerce which is controlled by Congress, you can register it in the United States Patent Office. Benefits received through state registration vary greatly among the states and should be investigated in the state in which you do business. If your mark qualifies for Patent Office registration, you can secure several important benefits under provisions of the Lanham Act of 1946 which make the protection of your mark considerably easier.

Practically all larger producers and many smaller ones avail themselves of the rights and benefits pro-

vided in the Lanham Act by registering their marks in the Patent Office. However, before such registration, it is examined much in the same manner that a court would examine it if its validity were challenged. If the mark meets the exacting requirements of the law it is registered. In most cases, courts must accept the registration as evidence of your ownership of the mark and your exclusive right to use it. Under certain circumstances it may become conclusive evidence of your right to use the mark and it may thereby become incontestable. Registrants are also entitled to rights and remedies for protection against infringement and unfair competition. And, finally, registration can also be constructive notice of your ownership of the mark.

Problems Are An Aid In Long Run

The many conditions and possible dangers involved in the selection of a trademark may seem burdensome and cumbersome. However, to be forewarned is to be forearmed. Careful consideration of the dangers and "taboos" to which reference has been made will result in the selection of a strong and valid trademark to which the courts will give the greatest protection. And the good will you strived so hard to build into your mark will pay off when customers confidently order your product by the trademark you have carefully chosen and developed. ▲



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Triple
Superphosphate
Superphosphate
Sheep Manure

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ARMOUR FERTILIZER WORKS
General Office, P.O. Box 1685, Atlanta 1, Georgia

Equipment & Supplies

Clark Equipment High-Lift Bucket

Gondolas and high sided trucks can now be loaded directly by Michigan tractor shovels fitted with a new high-lift bucket, re-



Contrast between standard Model 175A and similar tractor shovel fitted with high-lift bucket.

ports Clark Equipment Co. An attachment designed by the firm's Construction Machinery Div. for the Michigan Model 175 A tractor shovel increases dumping height of the bucket by 3 feet, 7 inches, and raises lower edge of the bucket to 12 feet, 1 inch.

For complete details,

Circle 340 on Service Card

Chemical-Resistant Tanks from Haveg

Polyester glass reinforced tanks offered by Haveg Industries are reported to resist the attack of liquid fertilizer solutions, phos-

phoric and sulfuric acids as well as other plant foods, insecticides and herbicides.

Extremely light, the tanks come in a wide range of sizes, even up to 30,000 gallons. Flat covers are available for all tanks. The firm also designs tanks for individual requirements.

For further data on the corrosion-resistant tanks,

Circle 341 on Service Card

Richardson Automatic Fertilizer Scale

The new HA-39 automatic fertilizer scale will weigh and bag up to twenty 80-lb. bags of fertilizer a minute, Richardson Scale Co. announces.

Pilot tests in the firm's labs have produced accuracies of \pm four ounces for the scale.

Incorporating such features as a power driven belt feeder within the scale, air cylinder discharge of hopper, totally enclosed dust-tight construction and stainless steel construction of all contact parts and parts exposed to fertilizer dust, the HA-39 fertilizer scale is designed in accordance with H44 specifications for weighing equipment, states Richardson.

For further details,

Circle 342 on Service Card

Four-Wheel Drive Payloaders Announced

The Frank G. Hough Co. has just announced introduction of two new four-wheel-drive, pneumatic-tired "Payloader" tractor-shovels—Model HH with payload capacity of $1\frac{3}{4}$ cu. yds. and



$1\frac{1}{8}$ cubic yards struck, and Model HU with payload capacity of $1\frac{1}{8}$ cubic yards and 1 cubic yard struck.

Among the new features incorporated in design of both the units are "Paylomatic" powershift transmission. Necessity of coming to a stop for a range-shift is completely eliminated with this transmission, since all shifts in both forward and reverse can be made without even slowing down, Hough reports.

For complete specifications and literature on both models,

Circle 343 on Service Card

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SUPERPHOSPHATE
UREA, 45½% & 46% N.
DI-N-CAL—20.5% N.
(Calcium Ammonium
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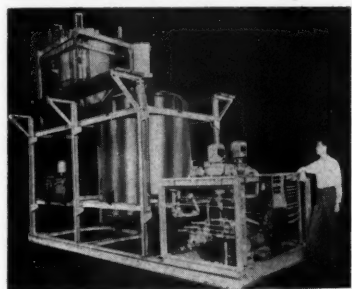
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HYNITE TANKAGE
CASTOR POMACE
GROUND
COTTON-BUR ASH
(38-40% K₂O Potash)**

Package Liquid Fert. Mixing Unit

Standard Steel Mfg. Co., Inc. has engineered and built a "package liquid fertilizer mixing unit" which it says is completely self-contained and automatically me-



ters and weighs all raw materials for batch mixing.

The mixing unit is skid-mounted and when completely assembled is 18 feet long, 8 feet wide and 14 feet high. Its manufacturer reports that it can be in operation the same day it is delivered and has mixing capacity of 120 tons of liquid fertilizer every eight

hours with one operator. It is said to be the only known unit that can use anhydrous ammonia for direct batch mix into complete liquid fertilizers without converting mechanisms.

For more information,

Circle 344 on Service Card

Hose Developed for Liquid Fertilizers

Hewitt-Robins, Inc. has developed a new hose to dispense liquid fertilizer and gasoline from farm storage tanks. It is made with a synthetic rubber lining resistant to ammonium nitrate solutions and petroleum products, with outer covering of green neoprene. Hose carcass is reinforced with a special heavy braid of cotton yarn for strength and durability.

The hose will be available in $\frac{3}{4}$ inch and one-inch diameters. For more information,

Circle 345 on Service Card

Blue Valley Adds Two Sizes to Line

Blue Valley Equipment Manufacturing & Engineering Co. has added two new sizes of granulating units to its line of fertilizer plant equipment, bringing to four the number of different units it makes—12, 18, 24 and 36 average ton-per-hour sizes.

Company officials say the four different units have been designed to fit needs and finances of any fertilizer plant. They are built for either single or double screening, and for either batch mixing or continuous ammoniation. For more data

Circle 346 on Service Card

Bin Level Indicator

Bin-Dicator Co. says its rotating-paddle-type bin level indicator is the first to be listed by the UL for use in hazardous atmospheres. For a copy of an illustrated catalog giving full details

Circle 347 on Service Card

Ashcraft-Wilkinson Co.

**Fertilizer
Materials**



**Feeding
Materials**

ALL FERTILIZER MATERIALS

FOREIGN AND DOMESTIC

Agricultural Chemicals

Nitrogen Compounds

Organic Ammoniates

Sulphur

Potash

**Exclusive Distributors: DUVAL SULPHUR AND POTASH COMPANY
ESCAMBIA CHEMICAL CORPORATION**

Vegetable Oil Meals and Feedstuffs

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NEW RATES...

Help wanted, positions wanted, used machinery and business opportunities are now charged at only 10 cents per word, \$2.00 minimum. Count box number as five words.

Display ads... \$15.00 per column inch, minimum of one

inch. Ads over the minimum are accepted only in multiples of one half inch.

For prompt results, send your classified ads to Farm Chemicals, 317 N. Broad St., Philadelphia 7, Pa.

Closing date: 10th of preceding month

BUSINESS OPPORTUNITIES

DISTRIBUTORS WANTED—

Wilnite, the original meat base warfarin, rat and mouse bait is again on the market. Choice, protected territories available. WILNITE CORPORATION, Box 243 North Platte, Nebr.

Suppliers' Briefs

Bemis Bro. Bag Co. announces appointment of A. N. Weeks as director of production succeeding A. H. Clarke. F. G. Bemis, Jr. replaces Weeks as manager of the multiwall paper bag plant at East Pepperell, Mass.

Bristol Co. S. E. Gewin is named district manager of the company's Chicago office.

Dust Suppression and Engineering Co. Offices have been moved to 120 S. Broadway, Lake Orion, Mich.

HELP WANTED

AGRICULTURAL SPECIALIST

Major chemical producer with headquarters in Chicago seeks man, age 25-35, degree in Agronomy or Agricultural Economics. Assist in development of new uses for old products and creation of new products, knowledge of survey techniques and applications, liaison with consultants in agricultural field. Address "555," care FARM CHEMICALS, Philadelphia 7, Pa.

MARKET ANALYST— AGRICULTURAL

Major chemical producer with headquarters in Chicago seeks man, age 25-35, degree in technical sciences or economics, preferably in agriculture or agronomy, with several years' experience in agricultural chemicals or allied products. Plan, prepare and interpret agricultural market studies of market potentials, sales patterns, sales analyses, prepare long and short term forecasts. Develop competitor and industry data, study acquisition and merger possibilities. Address "560," care FARM CHEMICALS, Philadelphia 7, Pa.

Fulton Bag & Cotton Mills.
Roy C. Jones is new assistant

manager of the Canvas and Pad Dept. and William F. Scupine, sales representative for Atlanta and the surrounding area.

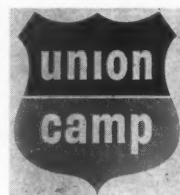
General Scientific Equipment Co. has moved to new quarters at 7516 Limekiln Pike, Philadelphia 50, Pa.

Howe Scale Co. F. E. Pringle has been appointed assistant general sales manager.

Richardson Scale Co. Arthur J. Burke and William Hamilton have been named vice presidents of Richardson Scale Co.

St. Regis Paper Co., Multi-wall Packaging Div. Three new regional sales managers—W. H. Versfeldt and W. T. Orr, Eastern District, and H. W. Walker, Mid-western District.

Union Bag-Camp Paper Corp. As a result of the recent merger, the firm has adopted a new trade mark for its combined line of products.



Yale & Towne Mfg. Co. Eric B. Insley and James N. McEntee are named manager and sales manager respectively of the new Materials Handling Div., Los Angeles Sales & Service Branch.

MONARCH SPRAYS



This is our Fig. 645 Nozzle. Used for Scrubbing Acid Phosphate Gases. Made for "full" or "hollow" cone in brass and "Everdur." We also make "Non-Clog" Nozzles in Brass and Steel, and

Stoneware Chamber Sprays now used by nearly all chamber spray sulphuric acid plants.

CATALOG 6-C

MONARCH MFG. WORKS, INC.
2501 East Ontario Street, Philadelphia, Pa.

SHUEY & COMPANY, Inc.

Specialty: Analysis of Fertilizer Materials and Phosphate Rock. Official Chemists for Florida Hard Rock Phosphate Export Association. Official Weigher and Sampler for the National Cottonseed Products Association at Savannah; also Official Chemists for National Cottonseed Products Association.

115 E. BAYSTREET, SAVANNAH, GA.

Dictionary of Plant Foods 1955 Edition \$1.00 postpaid

The reference booklet or all who are interested in production and use of chemical fertilizers.

Farm Chemicals, 317 N. Broad St., Phila. 7, Pa.

Chemicals

Petro. Sulfonates For Plant Nutrients

L. Sonneborn Sons, Inc. is developing a series of new petroleum sulfonates which act both as an agent for utilization and as a source of plant nutrients.

The new line of petroleum sulfonates is designed for use by manufacturers of plant foods.

Plant Stimulant Shows Promise

Remarkable acceleration in plant height has been experimentally achieved with a little known substance—gibberellic acid.

Preliminary studies also indicate that gibberellic acid may have potential for increasing the rate of growth and possibly the productiveness of a wide variety of crop plants.

The heights of crop plants such as snapbean, soybean, peanut, pepper, eggplant, corn and barley were in many cases doubled or tripled by the chemical. In limited tests, direct application of the acid to several plant fruits—tomatoes, snapbeans and peppers—did not affect growth. Included in the tests were young forest trees such as willow oak, tulip, poplar and maple, which all showed greatly increased growth following treatment.

Sugar Increase With New Chem.

Sugar cane growers in Hawaii have found that application of MH 30, a growth regulant, will increase the yield of sugar per acre by a ton and a half. The chemical, produced by U.S. Rubber Co., when applied in August or September will slow down the growth of the tassels which drain sugar from the stalks as the cane matures.

Slowing their growth chemically does not affect the health of the plant, and it keeps the sugar content high.

Mg and B Increase Cotton by 24-54 lb.

South Carolina reports that applications of manganese and boron will increase cotton yields to the extent of 24 to 54 pounds of lint per acre.

Tests were carried out over a three year period using colemanite and manganese sulfate plus boron and manganese frits. Further details of the tests are available from the South Carolina Experiment Station (Clemson, S. C.), Circular 104, "Minor Elements for Field Crops."

Geigy Encouraged By New Weed Killer

Geigy Chemical is very enthusiastic over its new weed killer called Simazin. Results of field trials in this country have proven it excellent as a pre-emergence herbicide on corn. It controls both broadleaf and grasses at 2 lbs. per acre. Midwest experiment stations have applied up to 16 lbs. of the chemical without damage.

European farmers are using the material in commercial quantities as a soil sterilant, at a rate of 5 lbs. per acre.

Material used in the United States is supplied by Geigy's plant in Switzerland. Because the material is not commercially available in this country, Geigy has not set prices on it but claims that it intends to sell the material at a competitive level with currently used herbicides.

Pesticides Protect Large Investment

Authorities claim that \$200 million in sales of pesticides in the United States protects \$30 billion in farm production investment.

NATIONAL CAL-MAG OXIDES —



MgO 40.39
CaO 58.07
TNP 203.88

Superior for Dehydrating, Neutralizing, and Curing factors in the preparation of effective fertilizers.

PROMPT SHIPMENTS

Three railroads serve our Carey, Ohio, plant — assuring prompt delivery—everywhere.

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DOLOMITIC
HYDRATED
LIME (165 TNP)
and
KILN DRIED
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(107 TNP)
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The **NATIONAL
LIME and STONE CO.**
General Offices
FINDLAY, OHIO

Fertilizer Materials Market

New York

September 12, 1956

Sulfate of Ammonia. No price changes were noted but demand slackened with the end of the steel strike. Most export business was expected from the Far East and India.

Ammonium Nitrate. Since prices were reduced recently, a slightly better demand was noted in some sections. Supplies were ample, however, to take care of any demand that should arise.

Urea. Shipments were going forward to industrial and fertilizer buyers with supplies ample and no price changes noted.

Nitrogenous Tankage. Market still remains at from \$3 to \$4 per unit of ammonia (\$3.64 to \$4.86 per unit N), f.o.b. shipping points according to location. Demand limited mostly to prompt shipment.

Castor Pomace. Last sales made on basis of \$35 per ton, f.o.b. production points, and production is rather small for this time of year.

Organics. Organic fertilizer materials showed little change in price over the past two weeks as many buyers were away on vacation and demand was limited to seasonal requirements. Tankage sold at \$5 per unit of ammonia (\$6.08 per unit N), and blood at \$5.25 (\$6.38 per unit N), f.o.b. Eastern production points. Soybean meal was easy in price and demand limited, with last sales for the 44 per cent grade at \$49.50 per ton in bulk, f.o.b. Decatur, Ill. Cottonseed meal moved in limited quantities, mostly to the

feed trade. Linseed meal was steady in price.

Fish Meal. There were conflicting reports as to the size of the fish catch, with some factories claiming poor weather had made fishing difficult and other plants stating the catch was good. The market showed little change in price, with last sales of ground menhaden fish meal in bags at \$134 per ton, f.o.b. fish factories. Very little imported material came in.

Bone Meal. Last sales were made on the basis of \$55 per ton, f.o.b. Eastern points for both feed and fertilizer grades. Imported feeding bone meal was quoted at slightly higher figures.

Hoof Meal. Last sales were made on the basis of \$6.25 per unit of ammonia (\$7.59 per unit N), f.o.b. Chicago, with some demand from industrial buyers. Fertilizer buyers showed some interest for future deliveries.

Superphosphate. This market was mostly a routine affair and the supply situation considered excellent. Demand was expected to pick up shortly.

Potash. Producers were shipping on contract and in some sections shipments were said to be behind last year. Several large shipments arrived at various ports of imported potash.

Philadelphia

September 12, 1956

The raw materials market is very quiet and seasonally dull. Export shipments of sulfate of ammonia and potash have helped somewhat to reduce inventories

which, however, are still ample. Tankage and blood are in slightly better demand.

Sulfate of Ammonia. There has been a good export demand and this has helped to materially reduce supplies on hand. No further price change is reported.

Nitrate of Ammonia. Inventories are large and production still seems to be ahead of last year. Movement is fair, with price discounts for early shipments.

Urea. This material is enjoying a good demand and production is increasing.

Blood, Tankage, Bone. Tankage is somewhat stronger this week with price at \$5 per unit of ammonia (\$6.08 per unit N) in New York area, and \$5.50 (\$6.68 per unit N) Chicago. Blood remains at \$5 (\$6.08 per unit N) New York and \$5.25 (\$6.38 per unit N) in the West.

Castor Pomace. Limited movement at \$35 to \$40 per ton.

Fish Scrap. Demand is rather slow and stocks not too plentiful. Scrap is quoted at \$131 per ton, with menhaden meal at \$135.

Phosphate Rock. Market is very quiet with production somewhat reduced, and fair domestic movement. Improved export demand is reported.

Superphosphate. Situation is seasonally quiet after a rather disappointing Spring. Supplies are large.

Potash. Domestic shipments are rather slow, but stocks are greatly reduced by large export demand. Prices are unchanged.

FARM CHEMICALS



PEST REPORTS

'Hoppers Cause Concern

Grasshoppers continued to cause concern in many states during late August and early September. Several areas of Idaho carried threatening populations of grasshoppers in late August. Populations continued high in several areas of Utah and control was being planned in early September for 70,000 acres of grazing land in Santa Cruz county, Ariz.

Crops were also damaged in several areas of eastern Colorado, and controls were necessary on flax and soybeans in several areas of North Dakota. In some unsprayed flax fields, 25-50 per cent of the bolls had been clipped and were on the ground.

Adult grasshopper surveys in northeastern Kansas counties showed populations the same as last year, light to threatening. In northwestern Kansas counties, light to threatening populations were recorded. Marginal damage to sorghums, soybeans, corn, cotton, truck crops and legumes was continuing in Oklahoma in early September. Sufficient populations were present in Missouri to be a threat to alfalfa, red clover, pastures, fall-seeded small grain and legumes. Some damage was occurring to marginal fall-seeded small grains in the southwestern part of the state. Marginal damage was also reported from Illinois and Minnesota.

Early reports on the adult survey in Minnesota indicated many counties with severe to very severe populations. Damage was occurring to new alfalfa seedings in Wisconsin with more trouble

anticipated. Heavy localized or general populations were reported from 18 Wisconsin counties.

Other Cereal, Forage Insect Activity

Fall armyworm was active from Maine to Texas during late August and early September. At Winslow, Maine, approximately 15 per cent of the corn showed infestations August 15. In areas of Delaware heavy damage to late corn occurred, while in Maryland damage was spotty. In Virginia, populations reached outbreak proportions on the Eastern Shore.

Heavy infestations on millet were reported from Spalding and Meriwether counties, Georgia. Corn was infested in Tift county, Georgia, with 100-125 larvae being taken per sweep. Louisiana reported general infestations with light to heavy populations in grass. In Missouri, up to 60 per cent of the late-planted corn was showing fall armyworm damage.

Some irrigated corn in Decatur and Norton counties, Kansas, was showing 40 per cent infestation.

Corn earworm infested corn and other crops in many areas of the country. Infestation was moderate in corn reaching Maryland canneries but in general lighter than normal. In northeastern North Carolina, 60 per cent or more peanut plants were infested and grain sorghum heads were being attacked.

The corn earworm with other caterpillars damaged soybeans in northeastern South Carolina.

Presented in cooperation with the Economic Insect Survey Section, Plant Pest Control Branch, Agricultural Research Service, USDA.

Heavy infestations were reported from Georgia and counts of from 70 to 95 per cent infested ears were recorded from Alabama. Worms were heavy in north central West Virginia and 75 to 100 per cent of the late sweet corn in Ohio was infested. In southwestern Kentucky, sorghum was receiving considerable damage with counts up to 30 larvae.

Missouri showed an average of two larvae per head of grain sorghum in the southwestern and west central parts of the state. The southern half of Missouri had an ear infestation of 95 to 100 per cent. Sorghum and alfalfa were attacked in Oklahoma and outbreak numbers were recorded in sorghum fields of southwestern Illinois. Corn in northeastern Kansas and southeastern Nebraska was nearly 100 per cent infested. Heavy infestations were reported from southeastern South Dakota and Colorado. New Mexico reported moderate to heavy damage to field corn from corn earworm and controls were necessary on canning corn in Utah county, Utah. The Lewiston area of Idaho reported sweet corn practically 100 per cent infested. Oregon's Willamette Valley averaged 10 to 15 per cent infestation, and earworms were prevalent but scattered in the Columbia River Basin and Yakima Valley of Washington.

Cotton Bollworm

Late August and early September saw the cotton bollworm causing concern in areas from California to South Carolina. During August, populations of the insect were reported in areas of Kern, Tulare and Imperial counties, California. In parts of Ari-

zona, the bollworm was the primary pest while in New Mexico damage was light to moderate with occasional heavy infestations. During August, the insect was a problem in the north and south plains, south central and central Texas areas. Irrigated cotton in Oklahoma carried the heaviest infestations but some eastern counties reported damage up to 10 per cent. Populations were high in most irrigated fields in Arkansas and control was

necessary in some Missouri fields. The worms were a threat in several Louisiana Parishes and although on the increase in the delta area of Mississippi had caused little damage. In western Tennessee counties, the worm caused damage in weevil-infested areas. Alabama in late August reported a 2 per cent infestation in nine central counties and Georgia, injured bolls ranging from 3 to 12 per cent in 17 counties. Early September bollworm

damage rose in Calhoun, Lancaster and Spartanburg counties, South Carolina.

Spider mites were in many fields throughout the San Joaquin Valley of California. Heavy infestations were reported in Arizona, Texas and Oklahoma. One-third of the fields in Missouri warranted controls. Heavy infestations were reported from other states but little control was being applied.

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PATENT REVIEWS

Concentration of Phosphate Ores

U. S. 2,744,625, issued May 8, 1956 to Wesley M. Houston and Harvie W. Breathitt, Jr., assigned to Minerals & Chemicals Corp. of America, describes a method of concentrating phosphatic minerals from their ores.

The ore is first subjected in an aqueous pulp to froth-flotation treatment with negative-ion reagents, thereby producing a froth-product which is a rough concentrate of the phosphate values mixed with some silicious gangue. This rough concentrate is subjected to another froth-flotation treatment in weakly acidic flotation water, removing as a part of the final product a froth-product having a low insoluble content, and a machine discharge which is a phosphate-rich middling. This middling is dried and subjected to electrostatic separation treatment, thus producing a high-grade phosphate concentrate which can be combined with the previously mentioned froth-product. The silicious gangue is discarded.

Patents on Controlling Undesired Vegetation

U. S. 2,744,817 and 2,744,819, issued May 8, 1956 to Burton V. Toornman and assigned to The Dow Chemical Co., relate to the control of undesirable vegetation by means of chemicals.

Many germinant seeds and emerging seedlings may be suppressed by exposure to the action of N,N-diphenyl crotonamide. Selective results can be obtained by applying proper dosages.

It has also been found that 4-

chlorophenyl 4'-chlorobenzenesulfonate, when distributed so as to contact the seed of annual grasses positioned in the soil suppresses the germination of the seed, without appreciable injury to established plants or the seed of many desirable plant species.

Beneficiation of Potassium Ores

U. S. 2,745,547, issued May 15, 1956 to Edgar E. Wrege and assigned to International Minerals & Chemical Corp., describes a process for the beneficiation of potash minerals by jigging.

In order to obtain good results, it is necessary to increase the apparent specific gravity of the medium from 1.00 (i.e. water) to about 1.8. This gives an increase of about 250 per cent in the separation efficiency, and can be obtained by suspending fine particles of langbeinite (smaller than 48 mesh) in the medium.

Process for Potassium Nitrophosphate Ferts.

U. S. 2,746,855, issued May 22, 1956 to Samuel Ruosch, describes a process for preparing, from potassium chloride, potassium nitrophosphate fertilizers which are stable and readily obtained in strewable form.

In order to avoid a low softening point, it is necessary to avoid reaction of the potassium chloride with calcium nitrate to form potassium nitrate and calcium chloride. This is accomplished by maintaining a low water content by using a short kneading time, and by avoiding temperatures as high as 65° C.

Two Patents Assigned To Dow Chemical Co.

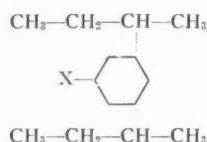
U. S. 2,745,781, issued May 15, 1956 to Doane Stewart and assigned to The Dow Chemical Co., discloses a method of increasing the parasitocidal effectiveness and decreasing the phytotoxicity of ethanolamine salts of 2,4-dinitro-6-secondarybutyl-phenol, by adding methylcellulose into the aqueous solution of the amine salt. The residual activity is also extended.

In U. S. 2,745,782 (same date, inventor, and assignee), the phytotoxicity of alkanolamine salts of 2,4-dinitro-6-cyclohexylphenol is also reduced by the addition of methylcellulose.

Chemical Group to Suppress Weed Growth

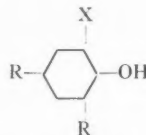
U. S. 2,747,982, issued May 29, 1956 to Dorsey R. Mussell and assigned to The Dow Chemical Co., describes a group of chemicals which suppress the growth of germinant seeds, emerging seedlings, and established vegetation of many undesirable types.

The chemicals are 4-halo-2,6-disecundarybutyl phenols of the formula



when X represents bromine or chlorine.

In U. S. 2,747,983 (same date, inventor and assignee), a similar group is disclosed, i.e. 2-halo-4,6-ditertiaryaryl phenols of the formula:



where X is bromine or chlorine, and R represents tertiarybutyl or tertiaryamyl.

▲
FARM CHEMICALS

Statistics

Coke-Oven Ammonia Statistics for 1954

The Bureau of Mines Minerals Yearbook for 1954 on Coke and Coal Chemicals shows that during that year, of 82 active oven-coke plants, 80 recovered ammonia, 67 made ammonium sulfate and 15, ammonia liquor, and that two plants produced both sulfate and liquor.

About 93 per cent of total ammonia produced, the report states, was recovered as ammonium sulfate and used almost exclusively for agricultural purposes.

Sulfur Output Up

Early 1956 data indicate that domestic production of Frasch and recovered sulfur through the first half of this year exceeded the output recorded for the same period of 1955, the U. S. Department of Commerce reports.

The department said that al-

though some trade sources have indicated that the summer seasonal slide-off was sharper than in previous years, it is expected that output and consumption will show their usual advance this fall.

Wisconsin Shows Plant Food Rise

Although fertilizer tonnage figures reported from Wisconsin for 1955-56 show a 3.76 per cent decrease from 1954-55, plant food content increased from 151,053 tons in 1954-55 to 153,509 tons, or 1.63 per cent. Tonnage was itemized as follows:

Complete Mixed Goods	308,763
Phos. & Potash Mixtures	71,639
Superphosphates	3,198
Other materials	28,193

Total Tonnage.....411,793

June Superphosphate Shipments, Stocks

In June, shipments of superphosphate and other phosphatic fertilizers amounted to 81,885 short tons, a decrease of 36 per

cent from the May, 1956 volume. Stocks on hand at the end of June were 21 per cent greater than those held on May 31, the Department of Commerce reports.

The department said that these monthly figures are unadjusted for seasonal variation and number of working days.

Mo. Fert. Shipments From Jan. to June

From January to June, 274,579 tons of mixed fertilizers were shipped, reports the University of Missouri. Most popular grade appeared to be 12-12-12, with 99,284 tons sold, followed by 3-12-12, 28,436 tons, and 4-12-4, 21,687 tons.

Tonnage of 47,117 was reported for ammonium nitrate, 12,116 for anhydrous ammonia and 4,133 tons of nitrogen solutions.

The university said that 3,398 tons of fertilizers with pesticides were shipped during the six month period.

Production — June, 1956

Compiled from Government Sources

Chemical	Unit	June		May
		1956	1955	1956
Ammonia, synth. anhydrous	s. tons	262,903	261,285	310,422
Ammonia liquor, coal & coke (NH ₃ content)	pounds	2,825,548	2,725,800	3,066,215
(Including diamm. phosphate & ammon. thiocyanate)				
Ammonium nitrate, fert. grade (100% NH ₄ NO ₃)	s. tons	124,949	129,765	145,804
Ammonium sulfate				
synthetic (technical)	s. tons	94,277	90,735	95,915
coke oven by-product	pounds	158,460,603	162,448,000	170,187,144
BHC (Hexachlorocyclohexane)	pounds	8,516,747	5,063,757	8,716,974
Gamma content	pounds	1,389,379	951,286	1,424,139
Copper sulfate (Gross)	s. tons			
DDT	pounds	12,099,684	**10,618,095	13,711,642
2,4-D Acid	pounds		3,328,348	2,627,036
esters and salts	pounds	3,066,534	**3,408,057	2,926,783
esters and salts (acid equiv.)	pounds	2,181,436	2,529,274	2,297,382
Lead arsenic (acid & basic)	s. tons	422	296	436
Phosphoric acid (50% H ₃ PO ₄)	s. tons	1299,338	261,312	322,354
Sulfur, Native (Frasch)	l. tons	565,002	425,050	543,217
Recovered	l. tons	37,600	32,500	38,500
Sulfuric acid, gross (100% H ₂ SO ₄)	s. tons	1,265,042	1,254,790	*1,381,850
Superphosphate (100% APA)	s. tons	169,187	142,446	*222,820
Normal (100% APA)	s. tons	92,137	94,159	*143,228
Enriched (100% APA)	s. tons	1,177	1,497	206
Concentrated (100% APA)	s. tons	62,619	46,568	63,805
Wet Base (100% APA)	s. tons	50	493	222
Other phos. fertilizers	s. tons	13,204	*15,088	13,584
2,4,5-T Acid	pounds	426,765	176,472	491,720
Urea	pounds	61,853,120		75,891,500
Calcium arsenate	s. tons	2,010		1,182

* Revised ** Partly estimated. n.a. not available.

¹ Includes quantities for 1 plant previously not reporting.

² Withheld to avoid disclosing figures for individual establishments.



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A few dealers gathering notebook material
for their course in selling farm chemicals.

Dealers Attend Ag Chem Merchandizing School

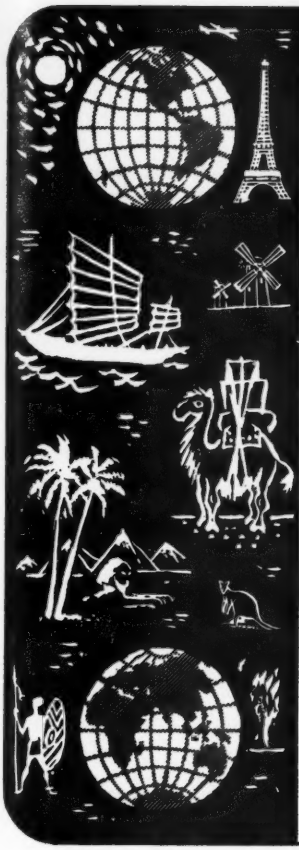
BACK to school seems to be the vogue these days. Down in Miami, Florida, 75 local dealers have enrolled in an educational program which had been running from July 9 to Oct. 1, designed to instruct them in the art of merchandizing agricultural chemicals.

The whole idea is based on the efforts of the local county agent of Dade county. Included in the subject matter presented are helpful aids covering areas such as merchandizing insecticides, fungicides and nematocides, as well as fertilizers and plant insect identification. During the course, technical information was distributed to dealers for later reference during their everyday selling.

Costs for the entire course amounted to two dollars covering materials. Instruction was given by the University of Florida which provided visual aids to assist in the identification of insects and plant diseases. In addition, instruction in the current application of recommended materials was provided the dealer with sufficient information to allow him to both recognize an agricultural problem, and also suggest correct remedies.

From the response received on the training program, officials are optimistic in being able to present technical data to such a responsive audience. By providing such information the course's aim is filled, increasing the professional skill of the dealer in his merchandizing efforts. In utilizing this background, dealers are able to suggest recommendations which in turn instill customers confidence in their dealer, thus guaranteeing return business.

As one enterprising dealer stated, "I haven't missed a single class. I am gaining much valuable information regarding soils, fertilizers and insecticides. This helps me to give the right answer to the questions asked by my customers." ▲



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editorial

*"Twixt the optimist and pessimist
The difference is droll:
The optimist sees the doughnut
But the pessimist sees the hole."*

McLANDBURGH WILSON

MANY people engaged in the fertilizer field are inclined to be on the pessimistic side, and see only the hole of the doughnut and not the ring. And they base their attitude on the lean and frustrating season the industry has just experienced, which could discourage anyone, making him wonder if the industry will ever see the brighter side.

Recent trends in the agricultural industry would indicate that there are many reasons to be optimistic. A predicted rise in farm income, for 1956, plus the removal of political uncertainties on the soil bank program should all help to create an optimistic viewpoint.

But before we engage in a bit of crystal-ball gazing, it might prove profitable to analyze a few points to find out why all this overproduction, price-cutting and additional plagues fell upon the industry. On top of a market of oversupply and severe competition, the plant food industry was caught in a vise-like squeeze between bad weather and consumer hesitation because of government uncertainty on the soil bank program. The end result was a decrease in fertilizer consumption of 5 per cent. This was certainly against the upward trend which had taken place before the beginning of this decade.

Overproduction seems to keep right on occurring with additional plants coming on stream during periods of lagging demand. Consequently we saw a resultant drop of \$8 per ton on anhydrous ammonia following a \$5 reduction on July 1 and still more plants to come. Potash facilities are in a similar position—more production facilities than market demand. In spite of the sluggish market, exploration for increased supplies is currently going on in Canada, while plants in the United States are either closed or operating at half capacity.

Why then should a company be willing to put millions into an investment which would seem fool-

hardy at the moment, and inherit all the headaches one could imagine for so little margin? Optimism for the long term future is the cause of it all. When reports come in saying that if all the farmers in the nation used the recommended rates of fertilizer advised by our agricultural extension services, the fertilizer industry would have to double its present capacity. Plants are constructed in anticipation of demand, not as a consequence of it. Note, too, that excess expansion has not taken place in phosphorus as it has in ammonia and potash, since anticipated demand has risen most sharply for the latter two ingredients. These producers are looking at the long term and not the short term view, as is typical of the chemical industry.

REASONS for a brighter outlook in the fertilizer industry and a steady rise in usage are some encouraging factors which would fall under the category of long term. Most noteworthy of these is the turnabout in farm incomes, resulting in more disposable income for reinvestment in fertilizer. To speed this trend, members of the industry are doing a noteworthy job in educating the farmer to use more fertilizer for greater income return.

Additional long-term trends, which would tend to increase fertilizer consumption, are the decrease in the number of farmers and the increase in acreage per farm. This tendency results in making the farming operation more businesslike, and consequently should result in increased fertilizer sales. Besides being a long term investment, the purchase of fertilizer is also a short term investment with a cash yield at harvest time. Larger farm operators, it would seem, are more prone to making cash investment in such high yielding short-term ventures.

In addition, optimism would seem to be justified by the trend towards more scientific farming operations plus the increase in farm size which indicates greater offtake in future years for fertilizer. Our increased populations of the future must by some means be fed on a limited amount of arable land, and one way of providing this increased production is through greater fertilizer application.

In conclusion, the future outlook for the fertilizer industry is one of greatly increased consumption and stability. The present problems of overproduction and poor prices would not seem to be a continuing legacy but merely growing pains.

W.P.S.

Editor

Buyers' Guide

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BORAX AND BORIC ACID

American Potash & Chemical Corp., Los Angeles, California
Woodward & Dickerson, Inc., Philadelphia, Pa.

BOX CAR LOADERS

Stephens-Adamson Mfg. Co., Aurora, Ill.

BROKERS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BULK TRANSPORTS

Baughman Mfg. Co., Jerseyville, Ill.
Highway Equipment Co., Cedar Rapids, Ia.

CALCIUM AMMONIUM NITRATE

Atkins, Kroll & Co., San Francisco, Calif.
McIver & Son, Alex. M., Charleston, S. C.

CALCIUM ARSENATE

American Agricultural Chemical Co., N. Y. C.

CALCIUM NITRATE

Atkins, Kroll & Co., San Francisco, Calif.

CAR PULLERS

Stephens-Adamson Mfg. Co., Aurora, Ill.

CARS AND CART

Stedman Foundry and Machine Co., Aurora, Ind.

CASTOR POMACE

Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

CHEMISTS AND ASSAYERS

Shuey & Co., Inc., Savannah, Ga.

CHLOROBENZILATE

Geigy Agr. Chems. Div. Geigy Chem. Corp. N.Y.C.

CHLORDANE

Ashcraft-Wilkinson Co., Atlanta, Ga.

CLAY

Ashcraft-Wilkinson Co., Atlanta, Ga.

CONDITIONERS

Ashcraft-Wilkinson Co., Atlanta, Ga.
H. J. Baker & Bro., New York City
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Finlay, Ohio
U. S. Graphite Co., Saginaw, Mich.

CONVEYORS

Baughman Mfg. Co., Jerseyville, Ill.
Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Joy Mfg. Co., Pittsburgh, Pa.
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Sturtevant Mill Co., Boston, Mass.

COPPER SULFATE

Phelps-Dodge Refining Corp., New York City
Tennessee Corp., Atlanta, Ga.

COTTONSEED PRODUCTS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

DDT

Ashcraft-Wilkinson Co., Atlanta, Ga.

DIAZINON

Geigy Agr. Chems. Geigy Chem. Corp., N.Y.C.

DIELDRIN

Ashcraft-Wilkinson Co., Atlanta, Ga.
Shell Chem. Corp., Agr. Chem. Div., N.Y.C.

DILUENTS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pioneer Pyrophyllite Producers, Beverly Hills, Calif.

DITHIOCARBAMATES

Berkshire Chemicals, New York City

ELEVATORS

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Stephens-Adamson Mfg. Co., Aurora, Ill.

ENDRIN

Shell Chem. Corp., Agr. Chem. Div., N.Y.C.

ENGINEERS—Chemical and Industrial

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

FERTILIZER—Liquid

Clover Chemical Co., Pittsburgh, Pa.

FERTILIZER—MIXED

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.

FILLERS

Bradley & Baker, N. Y. C.

Fish SCRAP AND OIL

Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

FULLER'S EARTH

Ashcraft-Wilkinson Co., Atlanta, Ga.

FUNGICIDES

American Agricultural Chemical Co., N. Y. C.
Berkshire Chemicals New York City
Tennessee Corp., Atlanta, Ga.

HERBICIDES

American Potash & Chemical Corp., Los Angeles, California
Lion Oil Company, El Dorado, Ark.

HERBICIDES—Oils

Lion Oil Company, El Dorado, Ark.

HOPPERS & SPOUTS

Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

IMPORTERS, EXPORTERS

Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Berkshire Chemicals, New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES

American Agricultural Chemical Co., N. Y. C.
American Potash & Chemical Corp., Los Angeles, California
Ashcraft-Wilkinson Co., Atlanta, Ga.
Berkshire Chemicals, New York City
Fairfield Chem. Div., Food Mach. & Chem. Corp., New York City
Geigy Agr. Chems., Div. Geigy Chem. Corp., N.Y.C.
Pennsylvania Salt Mfg. Co., of Wash., Tacoma, Wash.
Shell Chem. Corp., Agr. Chem. Div., Denver Colo.

IRON CHELATES

Geigy Agr. Chems., Div. Geigy Chem. Corp., N.Y.C.

IRON SULFATE

Tennessee Corp., Atlanta, Ga.

LABORATORY SERVICES

Wisc. Alumni Research Foundation, Madison, Wisc.

LEAD ARSENATE

American Agricultural Chemical Co., N.Y.C.

LIMESTONE

American Agricultural Chemical Co., N. Y. C.
Ashcraft-Wilkinson Co., Atlanta, Ga.
National Lime & Stone Co., Finlay, Ohio

MACHINERY—Acid Making and Handling

Monarch Mfg. Works, Inc., Philadelphia, Pa.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Acidulating

Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Grinding and Pulverizing

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Bradley Pulverizer Co., Allentown, Pa.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

Buyers' Guide

MACHINERY—Material Handling

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Clark Equip. Co., Construction Mach. Div., Benton Harbor, Mich.
Hough, The Frank G. Co., Libertyville, Ill.
Joy Mfg. Co., Pittsburgh, Pa.
Link-Belt Co., Chicago, Ill.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Stephen-Adamson Mfg. Co., Aurora, Ill.
Sturtevant Mill Co., Boston, Mass.
Tractomotive Corp., Deerfield, Ill.

MACHINERY—Mixing and Blending

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Munson Mill Mach. Co., Utica, N. Y.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Mixing, Screening and Bagging

Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Power Transmission

Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY

Superphosphate Manufacturing

Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MAGNESIUM SULFATE

Berkshire Chemicals, New York City

MANGANESE SULFATE

Tennessee Corp., Atlanta, Ga.

MANURE SALTS

Potash Co. of America, Washington, D. C.

METHOXYCHLOR

Geigy Agr. Chems., Div. Geigy Chem. Corp., N.Y.C.

MINOR ELEMENTS

Geigy Agr. Chems., Div. Geigy Chem. Corp., N.Y.C.
Tennessee Corporation, Atlanta, Ga.

MIXERS

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Munson Mill Mach. Co., Utica, N. Y.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

NITRATE OF POTASH

Berkshire Chemicals, New York City

NITRATE OF SODA

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
McIver & Son, Alex. M., Charleston, S. C.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
International Min. & Chem. Corp., Chicago, Ill.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NITROGEN SOLUTIONS

Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City.
Escambia Bay Chem. Corp., Pensacola, Fla.
Lion Oil Company, El Dorado, Ark.
Mississippi River Chem. Co., St. Louis, Mo.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Sinclair Chemicals, Hammond, Ind.
Sohio Chemical Co., Lima, O.

NITROGEN MATERIALS—Organic

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Jackie, Frank R., New York City
McIver & Sons, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray

Monarch Mfg. Works, Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

PARATHION

Ashcraft-Wilkinson Co., Atlanta, Ga.

PHOSPHATE ROCK

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

PHOSPHORIC ACID

American Agricultural Chemical Co., N. Y. C.

PLANT CONSTRUCTION—Fertilizer and Acid

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

POTASH—Muriate

American Potash & Chemical Corp., Los Angeles, California
Ashcraft-Wilkinson Co., (Duval Potash) Atlanta, Ga.
Bradley & Baker, N. Y. C.
Duval Sulphur & Potash Co., Houston, Tex.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
National Potash Co., N. Y. C.
Potash Co. of America, Washington, D. C.
United States Potash Co., N. Y. C.

POTASH—Sulfate

American Potash & Chemical Corp., Los Angeles, California
International Min. & Chem. Corp., Chicago, Ill.
Potash Co. of America, Washington, D. C.

PRINTING PRESSES—Bag

Schmutz Mfg. Co., Louisville, Ky.

PYROPHYLLITE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pioneer Pyrophyllite Producers, Beverly Hills, Calif.

REPAIR PARTS AND CASTINGS

Stedman Foundry and Machine Co., Aurora, Ind.

SCALES—Including Automatic Baggers

Exact Weight Scale Co., Columbus, O.
Stedman Foundry and Machine Co., Aurora, Ind.

SCREENS

Blue Valley Equip. Mfg. & Eng. Co., Topeka, Kans.
Ludlow-Saylor Wire Cloth Co., St. Louis, Mo.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

SHOVEL LOADERS

Clark Equip. Co., Benton Harbor, Mich.
Hough, The Frank G. Co., Libertyville, Ill.
Tractomotive Corp., Deerfield, Ill.

SOILTEST EQUIPMENT

The Edwards Laboratory, Norwalk, O.

SPRAYERS

Finco, Inc., N. Aurora, Ill.

SPRAYS

Monarch Mfg. Works Inc., Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.
Baughman Mfg. Co., Jerseyville, Ill.

SPREADERS, TRUCK

Baughman Manufacturing Co., Jerseyville, Ill.
Highway Equipment Co., Cedar Rapids, Ia.

STORAGE TANKS

Cole, R. D., Manufacturing Co., Newnan, Ga.

SULFATE OF AMMONIA

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackie, Frank R., New York City
Lion Oil Co., El Dorado, Ark.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFATE OF POTASH—MAGNESIA

International Min. & Chem. Corp., Chicago, Ill.

SULFUR

Ashcraft-Wilkinson Co., Atlanta, Ga.
Texas Gulf Sulphur Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFUR—Dusting & Spraying

Ashcraft-Wilkinson Co., Atlanta, Ga.
U. S. Phosphoric Products Div., Tennessee Corp., Tampa, Fla.

SULFURIC ACID

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Lion Oil Company, El Dorado, Ark.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

SUPERPHOSPHATE

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Jackie, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SUPERPHOSPHATE—Concentrated

Armour Fertilizer Works, Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TALC

Ashcraft-Wilkinson Co., Atlanta, Ga.

TANKAGE

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Jackie, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TANKS—NH3 and Liquid N

Cole, R. D., Manufacturing Co., Newnan, Ga.

TOXAPHENE

Ashcraft-Wilkinson Co., Atlanta, Ga.

TRUCKS—SPREADER

Baughman Mfg. Co., Jerseyville, Ill.
Highway Equipment Co., Cedar Rapids, Ia.

UREA & UREA PRODUCTS

Atkins, Kroll & Co., San Francisco, Calif.
Bradley & Baker, N. Y. C.
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Sohio Chemical Co., Lima, O.

UREA-FORM

Nitro-Form Agricultural Chemicals, Woonsocket, R. I.

VALVES

Monarch Mfg. Works, Inc., Philadelphia, Pa.

ZINC SULFATE

Tennessee Corp., Atlanta, Ga.

FARM CHEMICALS



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 New 60% Special Granular
 New 60% Coarse Granular
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ALLIED CHEMICAL

The trends to granulation and to higher analyses in mixed fertilizers are piling up production problems and bottlenecks as never before. They stress the need for new and improved nitrogen solutions to fit a wide variety of plants and ammoniation procedures.

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vide you with the nitrogen materials needed to manufacture better fertilizers at lower cost.

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